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VOLUME 11 • APRIL 1953 • NUMBER 2 JOURNAL OF ORAL SURGERY

An improved technic for roentgenographic examination of the temporomandibular joint and condyle

■ *Ronald Grant,* D.D.S., M.S., and Harry Lanting,† R.T., Dearborn, Mich.*

Roentgenographic examination of the temporomandibular joint and associated structures generally is limited to the lateral projection. Although this view is necessary, it has not always proved satisfactory inasmuch as considerable detail of the condyle is obscured by the superimposition of other bones of the skull. In this position gross pathologic changes of the capitulum are poorly demonstrated since the full extent of pathologic involvement cannot be completely visualized. The important feature of this view is the demonstration of the proximity of the articular surface of the condyle to the glenoid fossa. It is valuable in demonstrating the loss of joint space, hypermobility, ankylosis, and other articular disturbances of the condyle. By virtue of the positioning, a minimal portion of the bony structure is projected and only the narrow lateral aspect of the condyle and the lateral margin of the fossa are demonstrated.

A roentgenographic demonstration of the mediolateral diameter of the condyle of the mandible, when pathologic changes are suspected, enables the surgeon to predetermine the exact extent of change before recommending therapy. Although the lateral projection is important and should be a routine procedure in examination of the temporomandibular joint, the authors were interested in evolving a technic that would demonstrate the mediolateral diameter of the condyle. Every feasible approach has been investigated during the past 18 months and the technic developed through this study, which hereafter will be referred to as the orbitoramus view, will be presented.

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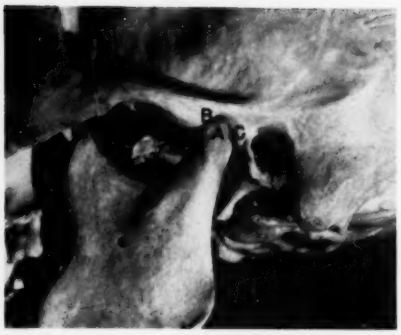

Fig. 1—Lateral view of temporomandibular joint. A: Condyle. B: Lateral margin of mandibular fossa. C: Lateral margin of articular tubercle

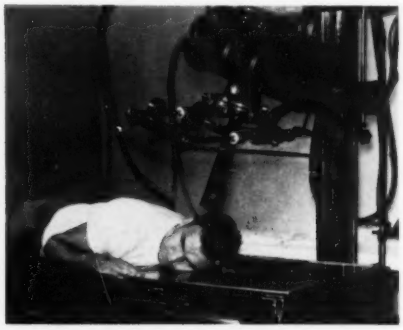

Fig. 2—Position of patient for lateral view technic. Note angulation of patient's face toward table with affected joint centered over cassette

During the period of development of the orbitoramus view technic, an attempt was made to standardize and simplify the lateral view technic. The observations made are presented here.

The orbitoramus view has proved a useful adjunct in the roentgenographic examination of the temporomandibular joint and its components for it allows adequate visualization of the mediolateral appearance of the condyle and the major portion of the neck. The technic was developed for use with the average medical x-ray machine. There should be little objection to the technic if the principles are carefully studied before its initial use.

A brief summary of the bony anatomic structures which comprise the joint should suffice for the purposes of this paper. Most important is an understanding of the osteological structures that comprise the temporomandibular joint and their roentgenographic appearance. The condylar process of the mandible articulates with the temporal bones to form the temporomandibular joint. This is situated anterior to the external auditory meatus and comprises the anterior part of the fossa of the temporal bone, the articular tubercle above, and the condylar process of the mandible below (Fig. 1).

In the interpretation of the roentgenographic appearance of the condyle, one must be able to differentiate the roentgenographic shadows of the styloid process, zygomatic arch, mastoid tip, and the coronoid process since these might be superimposed over the condyle during the roentgenographic procedure for the orbitoramus view. If the principles of exposure outlined for the technic are carefully applied, these extrinsic shadows can be al-

Table
Exposure factors

	Kv.p	Ma.	Time	Distance	Grid
Lateral view	74	150	1/2 sec.	30 in.	Potter-Bucky
Orbitoramus view	70	150	1/10 sec.	28 in.	Potter-Bucky

most entirely eliminated. It is also recommended that both the affected and unaffected sides be projected routinely for purposes of comparison.

■ *Positioning and Technic*

LATERAL VIEW—The patient is placed in a prone position on the x-ray table with the affected side against the table. The arms and hands are placed in a comfortable position. The face is angled downward 15 degrees toward the table with the affected joint centered over the cassette. The total tube angulation is 25 degrees toward the feet; however, as the patient lies in this position the midline of

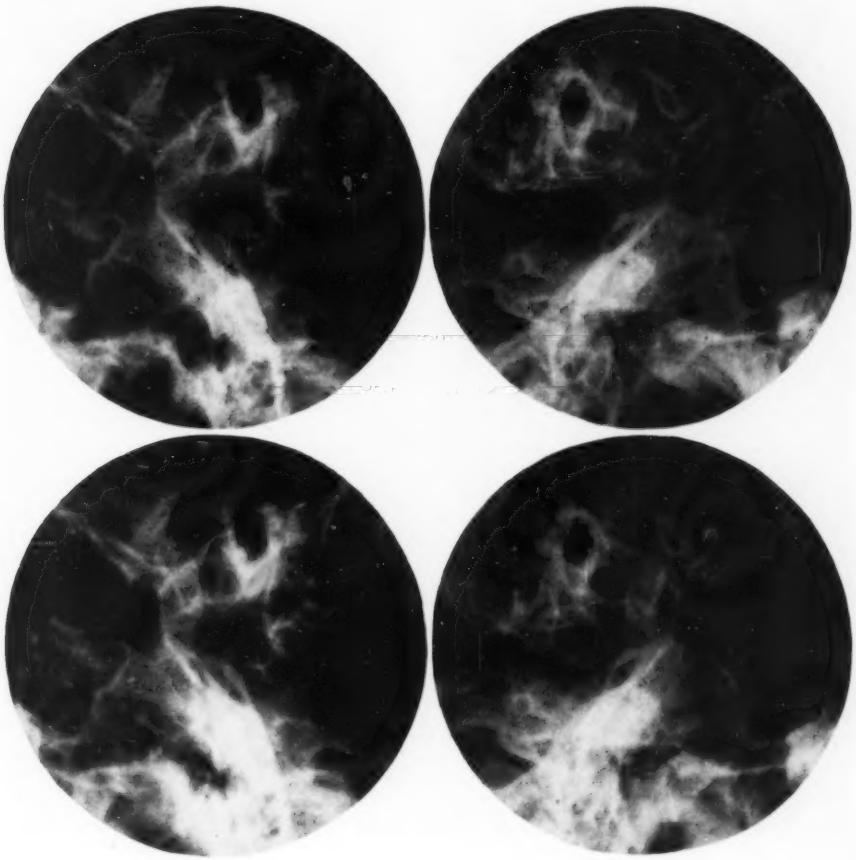

Fig. 3—Projection of temporomandibular joint on a single 8 by 10 inch film with patient's mouth open and closed. Right and left sides are shown

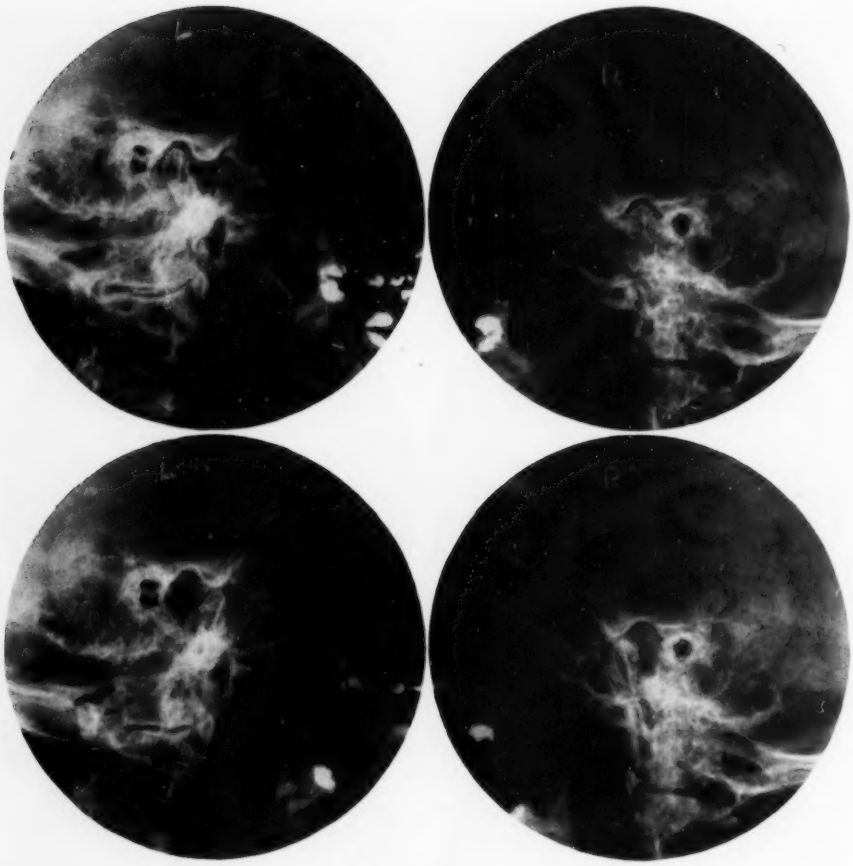

Fig. 4—Consistent views of temporomandibular joint obtained by use of this technic

the face from mid-forehead to the chin will not be at a right angle to the table. The difference in angulation subtracted from the 25 degree angle toward the feet will result in a total tube angulation between 10 degrees and 15 degrees toward the feet, depending on the facial contour. The central ray is directed to pass through the affected joint and the cassette is locked so the central ray bisects it (Fig. 2). The patient's face is placed in this position to decrease the "part-film" distance and to avoid possible movement of the patient's head. It is routine procedure to take this view with the mouth both open and closed and each of the joints are taken for comparative studies.

A small cone is employed with a

30 inch target distance. The central ray enters the skull at a point 2 inches posterior and 4 inches proximal to the unaffected temporomandibular joint (Fig. 2). Seventy-five milliampere seconds is satisfactory to balance the technic in order to obtain approximately 74 kv.p. (see exposure table). This results in a more satisfactory roentgenogram inasmuch as the various gradation densities in this region of the skull require a relatively moderate to high kilovolt peak. A lesser kilovolt peak would result in undesirable contrast. The Potter-Bucky grid is used in this technic and has proved, through extensive survey studies, to be a necessity for obtaining more satisfactory roentgenograms because the "part-film" distance is minimized. The patient is instructed to hold his breath while the roentgenogram is exposed, since movement of the chest during breathing could result in movement of the head with subsequent distortion of the image on the film. When the open-mouth view is taken, a large cork is placed between the teeth for better stabilization.

When an 8 by 10 film is employed, both the open-mouth and closed-mouth views can be exposed on the one film. A rubber mask is used to cover the respective portions of the cassette during exposure. This permits more accurate comparison in the interpretation of the final film (Fig. 3). The resulting films (Fig. 4) clearly demonstrate the advantage of this technic.

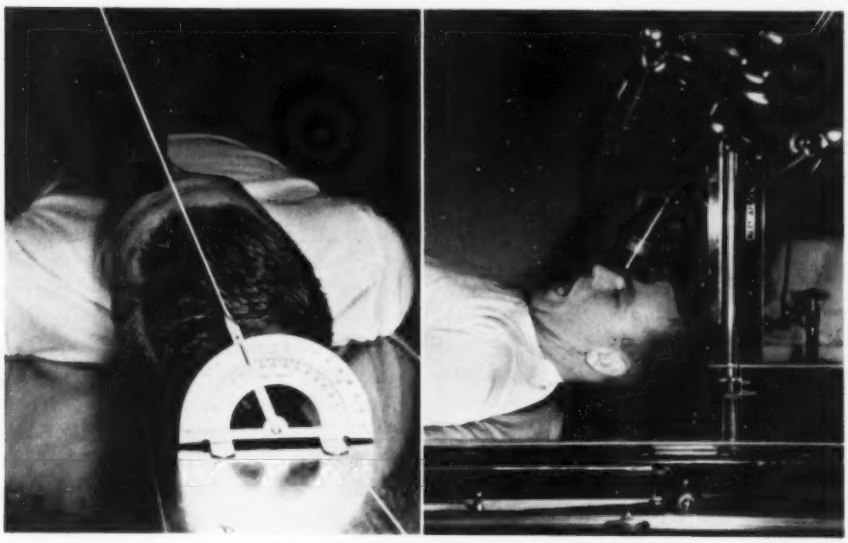

Fig. 5—Left: Position of patient's head when orbitoramus technic is used. Note head placed in 20 degree angle toward table. Right: Central ray of tube directed through inner canthus of eye. Patient's mouth is open during exposure

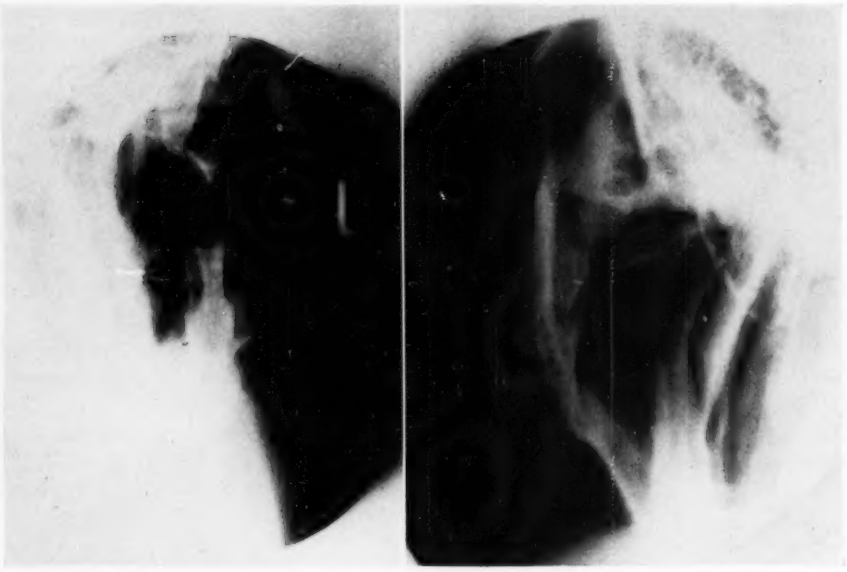

Fig. 6—Films which demonstrate the mediolateral diameter of condyle

THE ORBITORAMUS TECHNIC—The patient is placed on the table in the anteroposterior position with the head rotated 20 degrees to the affected side with Reid's base line perpendicular to the cassette (Fig. 5, left). The patient is instructed to open his mouth wide during the exposure (Fig. 5, right). The tube is angled 30 degrees in the caudal direction and the central ray is directed through the inner canthus of the eye on the affected side and projects through the upper ramus of the affected mandible (Fig. 6).

It is necessary, because the patient's position is somewhat uncomfortable, that a short exposure time be used. One hundred and fifty milliamperes at one-tenth of a second exposure has proved most satisfactory. This minimizes distortion and does not require that the patient remain in an uncomfortable position for any length of time. In order to balance the exposure factors, 15 ma. sec. is necessary to obtain sufficient milliampere seconds to use 70 kv.p. (see table). The latter is necessary for the average adult and insures proper density and contrast. The Potter-Bucky grid gives a more satisfactory result and is used routinely. The average film-target distance is 28 inches. Some magnification of the condyle results when employing this technic; however, it is not objectionable. Conversely, it is a decided advantage in interpretation. The films shown in Figure 6 demonstrate the advantage of this improved technic.

■ *Summary*

1. A technic for standardization of the lateral view of the temporomandibular joint has been presented as well as a new technic for roentgenographic examination of the mediolateral diameter of the condyle. The latter has proved to be a valuable adjunct in roentgenographic examination of the temporomandibular joint and its components.

2. A simplified technic has been developed which can be easily used with the average medical x-ray machine.

Treatment of old depressed fractures of the zygoma

■ *G. Kenneth Lewis, M.D., Chicago*

Displaced fractures of the zygomatic bones with impingement on the coronoid process of the mandible occur frequently and can easily be overlooked for a time after injury because of excessive swelling and ecchymosis of the overlying soft tissues. Such a fracture can be successfully reduced soon after the injury, but if not reduced, conspicuous flattening of the cheek and restriction of motion of the mandible ensues.

Gunshot and shell fragment wounds about the coronoid process of the mandible and zygomatic bone and arch sustained by members of the Armed Forces during World War II and the Korean conflict have produced several problems in restoration of function and appearance. The purpose of this paper is to discuss a successful method of restoring the facial contour with either rib cartilage or cancellous bone, combined with excision of the involved coronoid process.

Brown and associates[1] relate their observations and their treatment by resection of the coronoid process which was followed by relief of trismus in 27 patients with war injuries. Tai and Chen[2] report an exostosis producing limitation of motion between the zygomatic bone and coronoid process.

The zygomatic bone forms one of the most prominent parts of the facial contour. It is small and quadrangular and is situated at the upper and lateral part of the face. It forms the prominence of the cheek, part of the lateral and anterior

1. Brown, James Barrett, and others. Ankylosis of the coronoid process of the mandible (and associated scar limitation of jaw function). Plast. & Reconstruct. Surg. 1:277 Nov. 1946.

2. Tai, S. M., and Chen, Y. H. Exostoses of the coronoid process of the mandible. Chinese Med. J. 68:381 Nov.-Dec. 1950.

walls and floor of the orbit, as well as parts of the temporal and infratemporal fossae. It presents a malar and a temporal surface and four processes, frontospenoidal, orbital, maxillary and temporal, and four borders. With the zygoma it forms a buttress supporting the maxilla.

Complications arising from fracture of the malar bone and zygomatic arch are enumerated by Gillies, Kilner and Stone[3] as follows: nerve injuries, eyeball injuries, involvement of the antrum or nose, suppurating hematoma of the antrum, mechanical obstruction of the jaw movements by impingement of the zygoma on the coronoid process.

Diagnosis of fractures of the zygomatic bone is based on the history of the direct blow on the malar eminence and a group of significant physical findings. These are flattening of the upper cheek, with fullness of the lower cheek, ecchymosis of the tissues about the eye, possible diplopia (Fig. 1), and finally, roentgenographic evidence of fracture (Fig. 2). In some instances the continuity of the infraorbital nerve may be broken, producing anesthesia in its distribution, followed by emphysema from antral air.

The pathologic changes appearing in ankylosis have been described by Brown and associates[1] as both fibrous and bony

3. Gillies, H. D.; Kilner, T. P., and Stone, D. Fractures of the malar-zygomatic compound; with description of a new x-ray position. Brit. J. Surg. 14:651 April 1927.

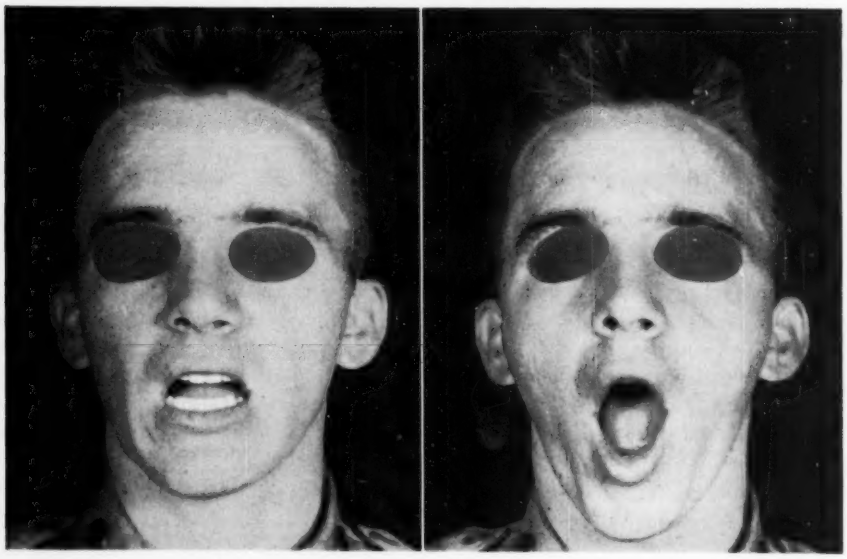

Fig. 1.—Left: Amount mouth could be opened preoperatively. Note flattening of left cheek and fullness of lower cheek. Right: Patient immediately after operation showing full opening of mouth

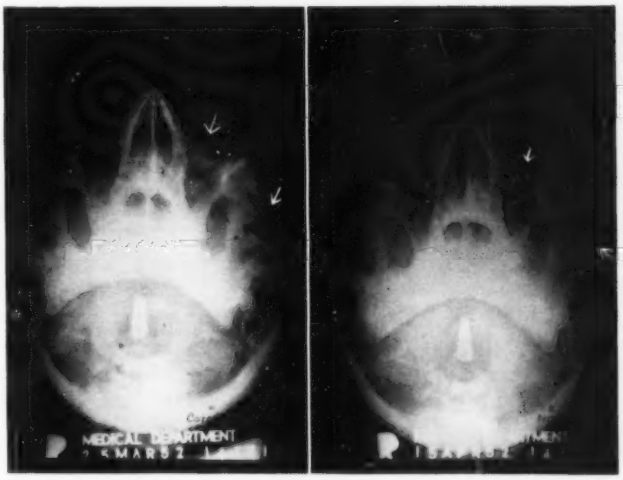

Fig. 2–Left: Preoperative roentgenogram showing fractures and coronoid process impinging on zygomatic bone. Right: Roentgenogram of patient taken immediately after operation in which coronoid process had been excised

ankylosis around the coronoid process of the mandible, the malar bone and the posterior aspect of the maxilla, with complications of extensive cicatricial tissue adding to immobilization of the jaw. They also point out that ankylosis involving the temporomandibular joint may extend forward to involve the sigmoid notch and coronoid process, or, conversely, ankylosis of the coronoid process may extend posteriorly to involve the temporomandibular joint.

Correction of fractures of the zygoma with impairment of mandibular excursion has for its purpose restoration of normal function of the mandible and the eye and restoration of the normal contour of the face. Spontaneous healing with fixation of fragments occurs within two weeks. Reduction therefore should be instituted at the earliest possible moment. The various methods of reduction are beyond the scope of this paper and are adequately described in standard surgical texts.

Failure to reduce such a fracture, which obstructs the excursion of the mandible by impingement of the coronoid process against the depressed zygoma, results in permanent inability to open the mouth. Refracturing of the depressed zygoma and attempted repositioning usually accomplish little in the way of improvement.

■ *Treatment*

A different method of approach is to accept the depression as it has solidified and restore the facial contour with either rib cartilage or cancellous bone. The diplopia resulting from the downward displacement of the level of the eyeball is corrected by the implantation of rib cartilage or bone graft along the floor of the orbit. The mechanical obstruction to excursion of the jaw is then relieved

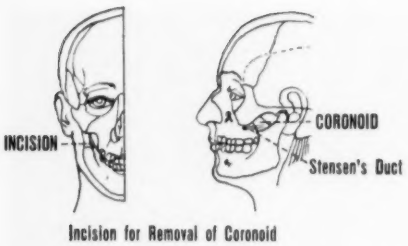

Fig. 3—Drawing on left demonstrates the incision on the anterior of ramus of mandible; drawing on right shows amount of bone removed at operation

by excision of the coronoid process. At the time of the operation, the index finger first palpates the anterior border of the ramus of the mandible on the affected side. An incision is then made to and through the periosteum from the upper fornix and down toward the lower fornix, overlying the anterior border of the ramus. By blunt dissection, the coronoid process is exposed and is easily identified by digital palpation (Fig. 3).

A small rongeur forceps is inserted into the incision and the coronoid process is grasped firmly. Since this part of the mandible is thin, either an outward or inward twisting of the instrument will easily fracture the coronoid process from the ramus of the mandible. This fragment is then brought forward and the temporal muscle is separated from it with a scalpel. The mouth can then be opened to determine whether further bone removal is required.

Healing occurs rapidly, and after the operation the patient is allowed to open his mouth at will. By the time soreness and tenderness have left, normal function has been attained. No dysfunction, loss of strength, or disturbance in occlusion of the teeth has been noted.

■ *Summary and Conclusions*

Displaced fractures of the zygomatic bone with impingement of the coronoid process are often encountered.

Coronoidectomy, combined with restoration of facial contour by cartilage implant and bone graft, has been used successfully by the author in a series of 15 patients. Release of the mandible has been immediate in all of the patients, and follow-up examinations have revealed no further difficulty.—*6 North Michigan Avenue.*

■ A Living Thing

Human nature is not a machine to be built after a model, and set to do exactly the work prescribed for it, but a tree, which requires to grow and develop itself on all sides, according to the tendency of the inward forces which make it a living thing.—*John Stuart Mill, "On Liberty."*

Preoperative management of the oral surgery patient

■ *Philip M. Northrop, D.D.S., Ann Arbor, Mich.*

Although skillful surgical procedures are imperative, the preoperative and postoperative care of the patient are equally important if a safe and successful outcome is to be achieved. As a matter of fact, the supportive care frequently is more complicated and difficult than the operative procedure itself.

Oral surgeons are constantly treating people who are suffering from disturbances that make them poor, or even dangerous, surgical risks. It is an obligation of the oral surgeon not only to operate skillfully on each patient but to manage him properly before and after as well as during surgery; to recognize and treat the individual who needs special management and to cooperate intelligently with the physician in more safely and effectively serving surgical patients.

Some of the preoperative problems which are often of grave concern to surgeons, which tax their knowledge, judgment and skill to the utmost and often demand special consideration and care are as follows:

1. Determination of the need for special management.
2. Management of the patient with cardiac disease.
3. Management of the patient with hyperthyroidism.
4. The surgical risk involved and management of the patient with hypertension.
5. Management of the patient with diabetes.
6. Precautionary measures for the arthritic patient.
7. Management of acute fulminating oral infections in patients where antibiotic sensitivities have developed.

It is always well to remember that there is no sharp dividing line between the preoperative and postoperative care, the plan of preparation, the supportive measures required during surgery, the operative procedure itself, and the management during convalescence, which are coordinated into a unified program of treatment devised to fit the particular needs of the patient. Although this discussion will be limited primarily to the preoperative care of these problems, it will be necessary at times to consider the postoperative convalescent period as well.

The importance of establishing an accurate diagnosis preoperatively cannot be overemphasized. An accurate diagnosis, not only of the dental problem but of the patient's general health, is important to the oral surgeon. It is the general health of the patient as the result of one or a

Professor of oral surgery, University of Michigan, School of Dentistry.

multiplicity of illnesses which causes the difficult problem of patient management.

Usually a few well-directed questions will suffice to discover whether the patient is a good operative risk; such questions as "How is your general physical health?" "Do you have any organic disease such as heart trouble, diabetes, high blood pressure?" "Have you ever had rheumatic fever, or trouble with your joints as a youngster?" "Have you been, or are you, under medical care?" "Have you been confined to bed at home, or in the hospital for any reason?" "Do you have a tendency to bleed freely?" A negative response readily informs the oral surgeon that the patient is probably a good operative risk for the usual office oral surgery procedures.

Frequently individuals are encountered who, through such questioning, provide a lead which indicates that a more detailed appraisal of their health should be made.

It is not the prerogative of the dentist to make a medical diagnosis. It is his responsibility, however, to take a case history that is of sufficient accuracy to establish the need for medical consultation. It is for this reason that dental schools throughout the United States have included in their curriculum, for many years, a method of taking a case history.

The student is given sufficient medical knowledge so that he can appraise the patient and decide if he is a safe operative risk, or if a medical consultation would be advisable before any operative procedure is performed. Frequently oral surgeons are the first to see patients who are suffering from some physical illness. Patients come to the oral surgeon convinced that they do not feel well because of some dental problem. This conviction may or may not be true. The point to be stressed is that the surgeon may be dealing with a patient with cardiac disease or uncontrolled diabetes, an individual with excessive output from the thyroid gland, or with some other condition which, if not recognized preoperatively, might easily terminate seriously should surgery be carried out before the disease is controlled.

■ *Problems in Managing the Patient with Cardiac Disease*

The surgical patient with heart disease—in fact, any patient with hypertension, nephritis, diabetes or any organic disease—should be under the care of an internist. It is important, however, that the oral surgeon have an academic and practical understanding of these problems.

Generally speaking, patients with cardiac disease withstand surgery well. It is true that when heart disease is present it may materially affect the surgical risk of operation. It is likewise true that the increased risk involved frequently is overemphasized. Many times a necessary operation is denied a patient whose health might be improved and whose general outlook might be made brighter by the correction of some operable pathologic condition. This effect has been shown by Lahey and Hurxthal[1] in thyrocardiac patients in whom the removal of the overactive thyroid gland was followed by spectacular improvement in the heart con-

1. Lahey, F. H., and Hurxthal, L. M. Postoperative end-results in 300 thyrocardiacs. Am. J. Surg. 24:225 May 1934.

dition, compensation being restored in practically all patients with congestive failure, with normal rhythm reappearing in nearly three fourths of all patients with auricular fibrillation.

The small increase in operative mortality, as a result of complicating heart disease, should not contraindicate elective surgery for the patient whose general health might thereby be improved if all precautionary measures are instituted. Therefore, it is important to consider carefully the influence of different types of heart disease on the surgical risk as well as the special preoperative and postoperative precautions which should be taken for the patient. This appraisal should be made by a competent internist and the oral surgeon working together.

Marvin[2] states that, "generally speaking, if a patient's heart has sufficient reserve capacity to enable him to carry out his daily activities without much difficulty, he can be subjected to anesthesia and operation with safety." When the heart is diseased, its functional reserve is decreased to a varying degree. The ability of the heart to withstand the stress of a surgical operation depends on whether the extra demand made on it exceeds its reserve capacity. Briefly, then, the operative risk depends on the patient's cardiac reserve. The following symptoms and signs are noted when determining cardiac reserve:

1. Degree of fatigue on moderate exertion.
2. The appearance of breathlessness or cardiac pain after exercise.
3. The occurrence of dependent edema.
4. A history of nocturnal dyspnea.

If none of these signs or symptoms are evident the patient is a good surgical risk. If any or all of these signs occur to a significant degree, then the extent and type of cardiac damage should be carefully studied.

Probably 90 per cent of heart disease can be grouped according to the type occurring in younger and in older patients. Heart disease resulting from rheumatic fever and congenital heart disease occur in the younger patients; arteriosclerotic and hypertensive heart disease, congestive heart failure, angina pectoris and coronary thrombosis, in the older patients.

YOUNGER PATIENTS—Patients with valvular heart disease resulting from rheumatic fever, or with congenital heart disease, are candidates for subacute bacterial endocarditis, especially if any type of surgery is performed.

Subacute bacterial endocarditis, before the advent of penicillin, always terminated fatally. Today cures are achieved in from 60 to 80 per cent of the patients if it is diagnosed early and adequate treatment is provided. This disease results from the lodging of bacteria on the scarred valves after the direct liberation of organisms into the blood stream (bacteremia). Bacteremia may follow any manipulative procedure and is of particular significance in connection with operations in the oral cavity because organisms in the mouth and throat (especially *Streptococcus viridans* and the enterococci) most frequently produce this serious complication.

2. Marvin, H. M. Heart during anesthesia and operative procedures. New England J. Med. 199:547 Sept 20, 1928.

Although the reported incidence of bacteremia after surgery in the mouth, and especially after dental extractions, varies from 17 to 75 per cent,[3-5] there is no doubt that it occurs frequently.

For several years well-informed physicians and dentists have advocated the prophylactic use of anti-infective agents, affording the patient added safety. In oral surgery, the institution of such treatment is imperative. As part of the preoperative appraisal of the patient, inquiry always should be made to determine if there is a history of rheumatic fever, chorea (which is considered a part of the rheumatic fever syndrome) and congenital heart disease. This special inquiry is necessary since frequently the patient will not volunteer this information.

Once definite or suggestive evidence is established, then prophylactic therapy should be followed. It is unnecessary to use antibiotics as premedication for all patients with cardiac disease. It is only of value when scarring of the heart valves has developed.

PROPHYLACTIC THERAPY—Although prophylactic antibiotic therapy is universally accepted by those who have dealt with patients with cardiac disease, there seems to be considerable difference of opinion about what constitutes adequate therapy. For some time at the University of Michigan, studies have been made to determine the minimum therapy necessary, the drug or drugs of choice, and how and when they should be administered. The suggested therapy is tentatively satisfactory.

It is believed that a combination of adequate doses of penicillin and streptomycin is the medication of choice. The selection of these two anti-infective agents is based on several factors.

First, the anti-infective agents, penicillin and streptomycin, in large doses, exhibit bactericidal properties on sensitive bacteria. All other agents possess bacteriostatic characteristics only. Penicillin and streptomycin, when used in combination, affect sensitive bacteria to a greater degree than when these agents are administered separately or in combination with other drugs. This action should be kept in mind when treating acute fulminating infections if the offending bacteria are sensitive to these drugs. The continued use of streptomycin should be watched with great care for two reasons. First, if kidney damage exists and kidney function is impaired, death may occur. Second, continued use (ten days to two weeks) may affect the vestibular nerve and result in permanent interference with the sense of balance. Further, the cochlear nerve also may be affected, which may result in permanent deafness. The use of streptomycin for a few days is a safe procedure since the complications mentioned result only when it has been used for a considerable time.

Compared with other agents, penicillin and streptomycin, combined therapeutically, destroy and inhibit a broader spectra of organisms inhabiting the mouth, especially those which usually produce

3. Northrop, P. M., and Crowley, Mary C. Prophylactic use of sulfathiazole in transient bacteremia following the extraction of teeth. J. Oral Surg. 1:19 Jan. 1943.

4. Glaser, R. J., and others. Effect of penicillin on the bacteremias following dental extractions. Am. J. Med. 4:55 Jan. 1948.

5. Okell, C. C., and Elliott, S. D. Bacteriaemia and oral sepsis, with special reference to aetiology of subacute endocarditis. Lancet 2:869 Oct. 19, 1935.

subacute bacterial endocarditis. The combination is especially effective against *Streptococcus viridans* and the enterococci. Aside from this synergistic advantage, streptomycin is administered because the enterococci are sensitive to it. The enterococci, that comprise 17 per cent of the bacteria in the oral flora,[6] are resistant to penicillin and frequently produce subacute bacterial endocarditis.

Of great interest is the observation that unless streptomycin is combined with penicillin it does not affect the enterococcus organism to any appreciable degree.[7] In fact, when given alone, the enterococci may become resistant in 24 hours.

Since oral surgeons are interested primarily in providing a high concentration of the antibiotic in the blood stream, especially at the time of bacteremia, there appears to be no therapeutic necessity for premedication a day or more before operation.

Should the patient be sensitive to penicillin, it is suggested that the surgeon use either aureomycin or terramycin without combining streptomycin. Streptomycin is not synergistic with these agents and only creates a resistant enterococcus.

The dosage of aureomycin and terramycin recommended for the adult is 750 mg. every six hours; for the child, 500 mg. every six hours, and for the infant, 250 mg. every six hours with milk.

If penicillin and streptomycin are to be given together, the recommendation at the University of Michigan for administration is as follows:

For the adult patient: Two cubic centimeters of a combination of 300,000 units of procaine penicillin G with 100,000 units sodium penicillin G buffered per cubic centimeter and 1 Gm. streptomycin or dihydrostreptomycin, to be given one hour preoperatively. The same dosage is to be given the succeeding day, and daily doses are to be given if infection is present.

The same dosage is given the child patient. If the child is very young, however, the dosage is decreased to 1 to 1.5 cc. of a combination of 300,000 units of procaine penicillin G with 100,000 units sodium penicillin G buffered per cubic centimeter and 0.5 Gm. streptomycin. The postoperative administrative routine is the same as for the adult patient.

The patient with active rheumatic fever should not be operated on unless there is an imperative need. Since the degree of myocardial damage is unknown, such a patient may develop heart failure.

OLDER PATIENTS—There are certain organic diseases of the heart which greatly increase the operative risk. Even though the patient is under expert medical supervision and care, such individuals must be treated with great caution.

Individuals with congestive heart failure should not be operated on except in an emergency. Syphilitic, arteriosclerotic or hypertensive heart disease greatly increases the operative risk. Patients with angina pectoris and coronary thrombosis are a bad operative risk, especially if the disease is acute. Surgery should be delayed if possible.

It is common for the oral surgeon to treat traumatic injuries and chronic or

6. Williams, N. B. and others. A study of the simultaneous occurrence of enterococci, lactobacilli, and yeasts in saliva from human beings. J. D. Res. 29:563 Oct. 1950.
7. Adcock, J. Personal communication, August 1952.

acute infectious processes in individuals suffering from organic heart disease who may or may not be under medical care. Such individuals are potentially hazardous patients.

After the cardiac abnormality has been recognized, all of the supportive care available should be instituted. The oral surgeon, by means of the history as well as clinical observation of the undiagnosed patient, may recognize or suspect some heart abnormality. He should place his patient under capable medical care. Sometimes the patient may be referred to the oral surgeon by a physician, in which case the cardiac status is fully known.

From the standpoint of the oral surgeon, there are certain problems in the management of the patient with cardiac disease that should be kept in mind constantly and every effort should be made to avoid, or at least to minimize, dangerous complications. Special attention should be directed to the control of the harmful or even dangerous responses of the patient with cardiac disease to mental anxiety, to pain or to the effects of vasoconstrictive responses to epinephrine when local anesthetics are used, to anoxia during general anesthesia, to excessive trauma and to prolonged operative procedures.

MENTAL ANXIETY—When a patient is hospitalized, even when his heart is fully compensated, it is usually wise to give him the benefit of a few days of rest before operation. Sedatives are about the only drugs necessary. Fluids should be used judiciously, administering them by mouth, if possible, to the extent of about 2,500 cc. daily. Excessive fluids overtax the diminishing capacity of the damaged organ and may precipitate heart failure.

The preoperative use of sedatives is highly recommended for all patients with cardiac disease. Sedatives, because of their hypnotic effect, are of value in relieving apprehension. The barbiturates are the drug of choice, not only for use in the hospital but for the ambulatory office patient. All barbiturates have the same action and vary only in their speed of action and their duration which depend on the speed with which they are absorbed and excreted. The short-acting barbiturates generally are used by oral surgeons.

Patients with cardiac disease or highly apprehensive individuals should be given a barbiturate the night before surgery and again immediately before surgery. One and one-half grains of secobarbital sodium or pentobarbital in capsule form is given on retiring. This usually acts in about 20 to 30 minutes. As a rule, either is eliminated in from four to six hours, so a repeat dose should be available in case it is needed. It is unwise to direct the patient who is to be operated on in the office to take the drug at home before coming to the office since occasionally, after sedation, the patient is affected adversely. He becomes disorientated, has difficulty in walking and is difficult to manage. All individuals who take barbiturates should have someone accompany them to the dentist's office as a precautionary measure against injury.

A small number of these drugs, in capsule form, should be available postoperatively to quiet the patient's nervous-

ness and to permit restful sleep. Barbiturates are not prescribed for pain. They are not anodynes and unless pain is relieved, the patient frequently becomes wild and disorientated. A prescription for only a few capsules should be written at one time. To write a prescription for a number of capsules of these drugs can be dangerous since the patient, after taking one, or even two, may reason that to take a few more will induce sleep even more effectively.

It is best to have patients come, with a companion, to the office a half hour before their appointment time. At this time, if barbiturates are used in capsule form, the drug is administered and the patient reclines in the recovery room while waiting for the operation.

Intravenous administration of pentobarbital was first used at the University of Michigan for preoperative sedation about two years ago. This method of administration has been so superior to administration in the capsule form that unless a vein cannot be entered, the intravenous method has been used almost exclusively. Aqueous pentobarbital or secobarbital sodium can be purchased in 50 cc. vials. In each cubic centimeter of fluid there is three-fourths grain of the barbiturate. Usually 1.25 to 1.50 cc. of the agent is injected. This amount can be injected rapidly and the effect is almost immediate. Such a method of administration is extremely convenient and satisfactory. The drug is placed directly in the blood stream and is eliminated rapidly, usually in about two to three hours. For the surgeons who have not administered barbiturates in this way, this routine can be recommended.

PREVENTION OF PAIN—For the patient with cardiac disease, it is desirable to relieve or prevent pain during an operation. If pain is produced during surgery, a dangerous or even a fatal outcome may be precipitated. Pain may defeat all of the carefully executed preoperative measures that have been carried out. Therefore it is essential for the surgeon to procure a profound anesthesia.

Most physicians advocate the use of a local anesthetic solution that does not contain epinephrine for the patient with cardiac disease. This is especially true if the individual has angina pectoris. It is known that epinephrine may precipitate anginal pain because of its vasoconstrictive action. Until recently the elimination of epinephrine from the local anesthetic solution presented a problem to the oral surgeon. The usual local anesthetic solutions without epinephrine have produced an anesthesia of such short duration that surgical procedures, as a rule, have been accompanied by pain. As mentioned earlier, the production of pain in the individual with angina pectoris may be potentially serious.

With full appreciation of the physician's reasons for requesting the elimination of epinephrine in local anesthetic solutions for these patients, it is, and has been, my belief that if certain precautionary measures are recognized and followed, a low content of epinephrine can be used with safety, thus assuring adequate prolonged anesthesia with the elimination of pain.

The method used has been to give the patient an adequate therapeutic dose of a barbiturate as a premedicant. If the patient has been taking nitroglycerine for

anginal pain after stress, he should take the agent just prior to the administration of the anesthetic. A local anesthetic with an epinephrine content of 1:100,000 is then given. After penetrating the mucous membrane, the injection is made very slowly. Whenever an injection is made where a vessel may be entered, such as in the inferior dental, infraorbital, and especially in the tuberosity injection, the plunger should be withdrawn before injection to be sure that a vessel has not been penetrated. If one injects directly into a vessel, and especially into a vein, the effect of the drug is increased many times over the effect when a subcutaneous injection is made.

Although the method of injection described has proved satisfactory, the relatively recent introduction to the profession of a new local anesthetic has provided an agent so profound in its action, in most cases, that pain is eliminated without the use of a vasoconstrictor agent. This anesthetic, lidocaine hydrochloride in a 2 per cent solution without epinephrine, has proved extremely satisfactory. The extent and duration time of surgery must be lessened, but for the usual procedures sufficient time is available to permit a deliberate surgical technic and, in most cases, it provides adequate anesthesia.

Surgery for the patient with cardiac disease should be executed as rapidly as possible. The physician usually requests that only a minimal amount of surgery be performed at one time. This practice often is unwarranted and subjects the patient to added hardship. If precautionary measures are followed and satisfactory anesthesia is obtained, the removal of several teeth, if rapidly and carefully executed, can be done with safety. This decreases the number of operations needed and eliminates mental anxiety for the patient.

When treating the patient with cardiac disease, it is well for the oral surgeon to outline to his patient's physician a treatment plan based on sound principles and logically supported. Once the attending physician becomes aware of the oral surgeon's problems and methods of management, prompt agreement usually is obtained and a mutual understanding and respect develops.

General anesthesia is a safe procedure if the patient is properly premedicated and the anesthetic is administered skillfully. The patient must be assured of a sufficiently high intake of oxygen.

Patients with cardiac disease are especially subject to shock which may result from the degree of trauma and the duration of the injury. The chance of survival during operation is greatly influenced by the ability of the operator to handle the tissue gently and to work quickly.

■ *Preoperative Consideration of Toxic Hyperthyroidism*

Thyrotoxic patients, even when under the best medical care, are a serious operative risk, and in oral surgery practice this type of patient occasionally needs treatment. He may be under adequate medical supervision or he may have been negligent about the frequent medical check-ups needed. Furthermore, a patient with early, or even well-established hyperthyroidism, may be seen by the dentist

before a diagnosis of the disease has been made or any treatment has been initiated for its control.

Toxic hyperthyroidism (exophthalmic goiter) is of unknown origin. It is associated with a diffuse, parenchymatous hypertrophy and hyperplasia of the thyroid gland with excessive thyroid secretion. As a result of this secretion there is an increased metabolism which creates certain physical manifestations and a disturbance of the autonomic nervous system.

SYMPTOMS—Individuals with toxic hyperthyroidism complain of fatigue, nervous excitability and considerable loss of weight, despite a ravenous appetite. In spite of their increasing weakness, they have a constant inner drive to do things, many of which are purposeless in nature. They have a feeling of warmth and they perspire freely. There is a fine tremor of the hands. Palpitation and a rapid heart beat are common. The patient with hyperthyroidism, because of his inability to meet the high caloric requirement, often is dehydrated and often complains of an unusual thirst. Exophthalmos is a cardinal sign of the disease.

Continued high metabolism exhausts the heart and causes great nervous and physical fatigue. Finally, diabetes frequently accompanies hyperthyroidism.

Surgery of a minor nature in the patient in whom the disease is uncontrolled, or in a patient receiving medication but where the disease is complicated and of long duration, may precipitate cardiac failure or a thyroid crisis.

Therefore, it is imperative that the oral surgeon recognize the manifestations of this serious disease and operate only when the patient is under the best medical care attainable.

Even when every precautionary medical treatment has been instituted, the surgeon should perform his work with great care. In general, the measures advocated for the patient with a serious cardiac condition should be followed. Patients with advanced toxic hyperthyroidism should be treated in the hospital as a rule. Should serious sequelae occur, their management can be carried out more effectively and under ideal surroundings, and the oral surgeon's responsibility is shared by others.

■ *Surgical Risk and Management of Hypertension*

Hypertension may accompany certain disorders, such as diseases of the urinary tract, or may occur as essential hypertension whose etiology is unknown. With hypertension, there is an increased peripheral resistance, especially of the arterioles, which produces an increased arterial pressure and is thought to be a compensating phenomenon necessary to force an adequate flow of blood through the narrowed vessels.

Hypertension, regardless of the cause, eventually produces changes of varying degree in the heart and blood vessels. Since most of the individuals with hypertension ultimately die of heart failure, these patients potentially have heart disease. The surgical risk, however, of precipitating heart failure in these patients is slight, provided heart failure, anginal responses or coronary thrombosis have not occurred in the past. Hypertensive patients potentially have nephritis and are subject to renal failure.

As a rule, hypertensive patients are safe operative risks, the severity of the hypertension exerting little influence if cardiac and renal function are normal. If the heart or kidneys have been damaged, the risk is greater since the operation may precipitate a vascular accident at a vulnerable spot.

With the hypertensive patient, it is desirable to know the status of the disease exactly, especially in the heart and kidneys. If unknown, it is wise to have medical counsel in the planning of treatment for the patient. Every precaution should be taken to prevent an undue rise in blood pressure in order to avoid a cerebral vascular accident. The chief cause of an elevation in blood pressure is excitement, pain or physical struggling during poorly administered general anesthesia. All these factors can be minimized or avoided by proper preoperative management and by the use of such technics as have been suggested for the treatment of the patient with cardiac disease.

Since hypertensive patients bleed more freely, even if their increased pressure is arterial, a special effort should be made to control any bleeding or oozing at the time of surgery. An effort should be made to stop any bleeding from the bone or from under flaps of soft tissue. Such bleeding can be controlled by firm pressure or by applying a hemostat if hemorrhage is arising from a bleeding point. Further control can be effected by suturing the soft tissue and then applying an overlying pressure for some time. Such treatment will avert the necessity of seeing the patient at a later hour and frequently prevents the oozing of blood out into the surrounding operative region. This oozing of blood will result in edema, ecchymoses and pain.

■ *Preoperative Problems with the Diabetic Patient*

There is probably no other organic disease which requires the cooperation of the internist and the surgeon to a greater extent than diabetes. Joslin[8] has said that the diabetic patient undergoing surgery is six times as likely to die as the diabetic patient who is under medical care only. The diabetic patient whose disease is controlled medically usually is a good operative risk, whereas the person with diabetes who has improper, or no, preoperative care is a dangerous risk.

Diabetes is a disease of unknown cause, characterized in the case of a patient in whom the disease is uncontrolled by an elevated concentration of sugar in the blood and urine, and in more advanced stages by acidosis.

In elective surgery, delay should be the rule until the disease is controlled, or at least until adequate therapy has been instituted. In the event that a surgical procedure is urgent, insulin therapy permits emergency operation until other necessary treatment can be begun.

The presence of infection is always dangerous in an individual with diabetes. The diabetic patient is more susceptible to infection since arteriosclerotic changes occur in the vessels of the kidneys, the coronary vessels and the peripheral arterioles and, as a result, circulation is less reliable or satisfactory.

8. Joslin, E. O. Diabetic surgery from medical point of view. Boston M. and S. J. 196:127 Jan. 27, 1927.

Again, the need of taking a case history is obvious. From questioning, the dentist becomes suspicious of diabetes, or he may encounter a patient who is diabetic but has not been under medical treatment or observation for some time. In any case, surgery should be delayed until the patient's status has been established and, if necessary, medical treatment instituted. It should be remembered that proper dietary measures and insulin therapy are the only treatments of value for the person with diabetes.

The following clinical signs and symptoms characterize diabetes: excessive thirst, increased urination, excessive appetite, noticeable loss of weight, general weakness, itching of skin, constipation, somnolence, visual defects, muscular pains, furunculosis (which is common) and acetone breath.

It should be re-emphasized that diabetes must be diagnosed and every preoperative safeguard instituted before any operation is performed. Infections, once the medical therapy is in effect, must be eliminated since infections often delay control of the disease. Local anesthetics and gas-oxygen anesthetics are most desirable and less dangerous than those which cause prolonged unconsciousness. The prophylactic use of antibiotics is considered good treatment since diabetic persons are highly susceptible to infection. Extensive and prolonged operative procedures should be avoided. After surgery has been performed on the patient whose diabetes is controlled, a re-evaluation of the patient's status should be made, since any procedure, even of a minor degree, may change the metabolic mechanism or diabetic condition which had been controlled by the medical treatment prior to surgery.

■ *Precautionary Measures for the Arthritic Patient*

The problem posed by the patient with chronic or acute arthritis is one that frequently concerns the surgeon who is dealing with an infectious process at the time of surgery. The question arises, will an exacerbation of the process occur or will the arthritis become generalized as a result of a bacteremia from the surgical trauma?

The only type of arthritis that has been found to be specifically influenced by trauma is gout.[9] It is well recognized that even a minor procedure can produce an acute exacerbation of this disease. Since the drug, colchicine, is specific for gout, it should be used prophylactically whenever infection is present or surgery is performed on such individuals. Colchicine should be administered two days preoperatively and postoperatively.

Although there is no scientific evidence that surgical trauma influences any other acute or chronic type of arthritis, it is generally felt that antibiotics should be used preoperatively and postoperatively when an arthritic process is present. An added safety is provided the patient by elimination of the possibility of an acute flare-up of the disease resulting from the release of large numbers of bacteria or of their toxins.

■ *Acute Fulminating Infections*

Occasionally a severe acute infection develops in an individual who has become

9. Robinson, W. D. Personal communication, August 1952.

sensitive to antibiotic therapy. The care of such an individual is a difficult problem.

Many times a patient has developed a sensitivity to penicillin but it is still possible to administer aureomycin and terramycin. The dosages of either aureomycin or terramycin are the same as the dosages advocated for the treatment of endocarditis. Both drugs, although not as effective as the combination of penicillin and streptomycin, produce remarkable effects on sensitive organisms and, fortunately, most of the pathologic organisms about the mouth are sensitive to their bacteriostatic action. The earlier that anti-infective agents are utilized in the course of an infective process, the more effective is their action on bacteria because these agents prevent the multiplication of bacteria.

At the present time there is considerable controversy concerning the use of chloramphenicol. It has been noted that occasionally blood diseases, especially aplastic anemia, develop after its use. In rare instances aplastic anemia has developed after the administration of other chemotherapeutic agents. The incidences of this complication are much greater, however, when chloramphenicol is introduced in the treatment. At the University of Michigan Hospital the present policy, until more reliable data become available, is to use this agent only when its use appears absolutely imperative.

When sensitivity to antibiotics has produced only minor reactions, the accompanying use of antihistamines permits the administration of the antibiotics with safety.

When severe reactions have occurred previously, and when sensitivity has been developed to penicillin, aureomycin and terramycin, then a difficult situation exists should a serious fulminating infection develop. Such a patient must be hospitalized immediately and every possible supportive care instituted. The patient thus is relieved of pain and excitability, his nutritional requirements are met and a proper water and salt (or ion) balance is established. The importance of providing adequate nourishment and the need for regulating a necessary and optimal fluid and salt (or ion) balance cannot be overemphasized. The discussion of these requirements is too complex to include in this article. A careful study of these problems, however, should be made by all oral surgeons. Texts on the preoperative and postoperative care of the patient undergoing surgery discuss their importance in great detail. By meeting nutritional needs and establishing an adequate water and salt balance, the patient's health and his ability to combat infection and to withstand surgery are greatly improved.

Individuals for whom immediate surgery is necessary and who are suffering from nutritional difficulties, anemia or dehydration may be treated by transfusions of whole blood. Such treatment will improve greatly the operative risk.

Sheldon[10] has observed that these patients, although highly sensitive to penicillin G so that its use is prohibited, can tolerate penicillin O with safety. Before administering penicillin O, it is wise to test the patient's sensitivity to this agent. Penicillin O is available in an aqueous

10. Sheldon, J. M. Personal communication, August 1952.

form and, if given therapeutically, must, as with aqueous penicillin G, be given at short intervals in order to maintain a highly effective therapeutic level.

To test for sensitivity to penicillin O, the aqueous preparation should be diluted until one unit of the agent is available in one drop of solution. This is injected intramuscularly. As an added safeguard, 50 mg. of diphenhydramine hydrochloride or some other antihistamine is given by mouth a half hour prior to the intradermal test. If after one-half to one hour no tissue reaction is observed, it is usually safe to administer the drug in full therapeutic doses.

Individuals who have developed sensitivities to antibiotics are not necessarily sensitive to sulfonamides, so these agents are available and they usually are safe.

In the event that no anti-infective agent can be tolerated, the best supportive care available should be given, with the hope that the defense mechanisms of the body will be adequate. Then the necessary surgery is performed at the most optimal time.

■ *Summary*

An accurate evaluation of the patient always must be made preoperatively. A close cooperation with the internist is mandatory in order that the the oral surgeon can operate and insure the greatest safety for his patient. Certain practical measures for the surgeon to institute in the management of the patient are advocated.

■ One Way to Reach Them

Leadership must fulfill the spiritual as well as the material needs of man. It must be the kind of leadership that opens the door to truth, and understanding, and must recognize the part that the heart plays in any human undertaking. I think that Richard L. Evans analyzed this quite well when he said: "The pattern of human conduct would seem to indicate that there are many ways of moving men, but only one way that may be depended upon to result in permanent good for all. You can push men around with a strong arm. You can overwhelm them with authority. You can stampede them with fear and panic. You can confuse them with falsehood. You can wear them down with insistent argument. But the only way of moving them willingly and effectively, and of keeping them moving in the right direction, is to touch their lives and their hearts with truth, to open their minds to the light of truth . . . to show them sound ways which they will pursue of their own free will, without being pushed or coerced or deceived. To push men around, to enslave them, to coerce them, to regiment them is a thankless job, and one that holds difficulty for all and satisfaction for none. But to touch them in their hearts and their thoughts, to convert them to truth, to transform their lives from within rather than to force them from without, is a glorious and satisfying experience for all concerned."—*H. M. Nordberg, vice-president of Pitney-Bowes, Inc., quoted in Industrial Medicine and Surgery 20:416, September, 1951.*

Correction of prognathism

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Prognathism is commonly defined as protrusion of the mandible and is frequently a hereditary deformity. It may develop as the result of some of the diseases of childhood, the early loss of deciduous teeth, the late eruption of permanent teeth or abnormalities of the tongue. Hyperpituitarism, particularly in the young adult, sometimes causes prognathism. Rickets, syphilis and traumatic injuries are other factors bearing directly on this abnormality.

As early as 1849, Hullihen performed a successful correction of prognathism by means of an intraoral operation. A similar operation was performed by Blair almost 50 years later. Since these operations, several others have been developed, each correcting the deformity by repositioning the teeth after mandibular ostectomy or osteotomy.

In 1944, Dingman[1,2] described a two-stage procedure for correction of prognathism. Four years later, he presented a review of his technic, which was a modification of the methods introduced by Harsha[3] and by New and Eric.[4] The procedure used in the report to follow is similar to the technic advocated by Harsha and modified by Dingman.

Inasmuch as no two cases are exactly alike, each requires careful study for the selection of the proper surgical procedure. Such problems as the number and location of teeth require consideration as to the shape and amount of bone to be removed, in order that the desired results may be achieved. The crest of the alveolar ridge must be kept in line in edentulous areas.

When the anterior teeth are absent, it is desirable to reposition the mandible in a way to permit replaced lower teeth to close in normal occlusal relationship. Among the more mechanical problems to be considered are the need for grinding to correct occlusal surfaces and the possible requirements for preoperative or postoperative orthodontic appliances. In most instances, orthodontic treatment is best carried out after completion of the surgical phase of correction, since fixation frequently produces tooth movement. The need for consideration of the type of fixa-

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1. Dingman, R. O. Surgical correction of mandibular prognathism; improved method. Am. J. Orthodont. & Oral Surg. (Oral Surg. Sect.) 30:683 (Nov.) 1944.

2. Dingman, R. O. Surgical correction of developmental deformities of mandible. Plast. & Reconstruct. Surg. 3:124 (March) 1948.

3. Harsha, William. Bilateral resection of jaw for prognathism: report of case. Surg., Gynec. & Obst. 15:51 (July) 1912.

4. New, G. B., and Eric, J. B. Surgical correction of mandibular prognathism. Am. J. Surg. 53:2 (July) 1941.

tion to be used and the type of patient to be treated must not be overlooked.

It is hazardous to assume that every patient with prognathism might be a potential candidate for surgical correction. Many persons suffer no serious handicap from the deformity, and many others apparently in need of surgical correction are physically or psychologically unsuited for the procedure. The patient's physical condition, his intelligence and his willingness to assume his portion of responsibility in the course of treatment should be carefully evaluated. The irresponsible or disinterested patient is no more to be selected for treatment than is the patient with diabetes, a blood dyscrasia or an uncontrolled endocrine disturbance.

Preoperative studies must also take note of the facial contours and the size of the dental arches. To this end, good mounted stone models are indispensable in recording of the preoperative findings and estimation of the postoperative results.

■ *Report of Case*

A 24 year old white man was admitted to the hospital in January, 1951, for preoperative studies and evaluation of severe prognathism. Photographs and roentgenograms were made and careful measurements taken, with the use of artificial stone models articulated in the preoperative and the proposed postoperative occlusions.

The patient stated that he had had protrusion of the mandible and malocclusion since childhood (Fig. 1). His father and paternal grandfather had very prominent chins. Protrusion of the mandible measured approximately ¾ inch, with absence of occlusal contact except by two opposing molar teeth on each side. The angle of the mandible measured approximately 110 degrees, a factor of considerable importance in selection of the site for operation (Fig. 1-6).

Fig. 1—Profile view showing mandibular protrusion before operation

The patient had lost the left mandibular first and second molars and the right mandibular first molar (Fig. 2). Masticatory function was thereby reduced, and the patient began to feel pain in the temporomandibular joints after eating. He demonstrated the contrast in the size of the opposing dental arches by enveloping the upper arch with the lower.

Results of physical examination and routine laboratory tests were within normal limits. Because of the mechanical problems involved and the danger of postoperative complications, resection by osteotomy was rejected in favor of the following technic.

The first stage of the operation was done on February 7, 1951. Under bilateral

mandibular block anesthesia, with additional procaine injected at the site of incision for hemostasis, an incision was made along the crest of the alveolar ridge posterior to the lower right second molar. The mucoperiosteum was reflected from the bone, and a ¼ inch section of bone extending from the crest of the ridge to the inferior dental canal was removed. Care was exercised to avoid injury to the mandibular nerve (Fig. 6A). The operation was repeated on the left side of the mandible behind the third molar. Before the wounds were closed, bur marks were made in the buccal plates of both the left and right sides of the mandible below the inferior dental canal. These marks indicated the site of the sections of bone removed (Fig. 6A. dotted line below canal) and were made to facilitate location of the

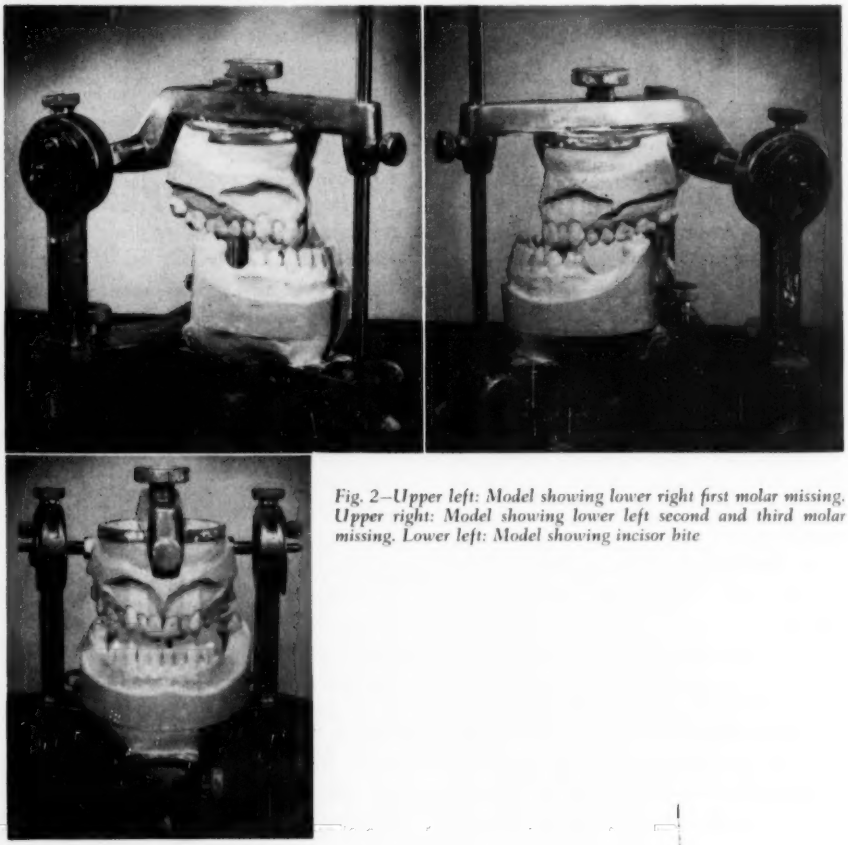


Fig. 2—Upper left: Model showing lower right first molar missing. Upper right: Model showing lower left second and third molar missing. Lower left: Model showing incisor bite

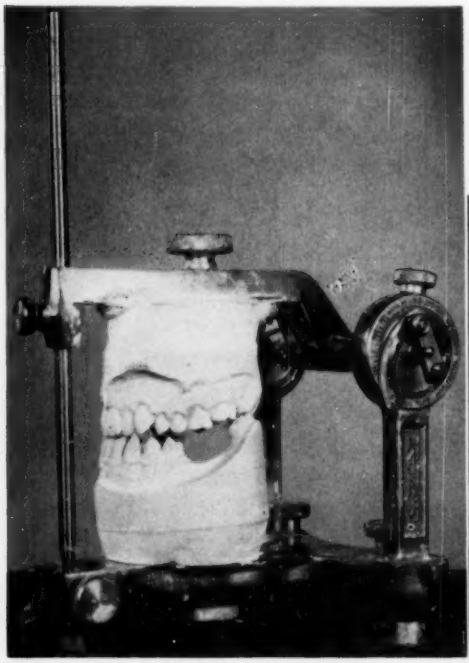
Fig. 3—Left: Stainless steel wires used to stabilize left mandible. Right: Stainless steel wires used to stabilize right mandible

initial cuts at the time of the second operation. The soft tissue was approximated and closed with silk sutures.

Winter arch bars were preshaped on stone models and then applied to the patient's teeth. Penicillin, 300,000 units daily, was administered beginning two days prior to the second operation.

On March 8, under intravenous thiopental sodium anesthesia in combination with nitrous oxide and oxygen administered nasoendotracheally, an incision was made through the skin slightly below the inferior border of the left side of the mandible. It began about ¼ inch posterior to the angle and extended forward about two inches. The periosteum was retracted medially and laterally until the bone cuts made during the intraoral operation were exposed.

These cuts were extended, and a section of bone reaching from the inferior dental canal to the lower border of the mandible was removed. The mandibular nerve was exposed and identified along with its accompanying blood vessels. A small portion of the medullary bone was hollowed out to prevent crowding of the nerve and blood vessels when the mandibular segments were rejoined (Fig. 6B, lines show pocket-like space). The procedure was repeated on the right side of the mandible. Stainless steel sutures were passed through holes placed just below the



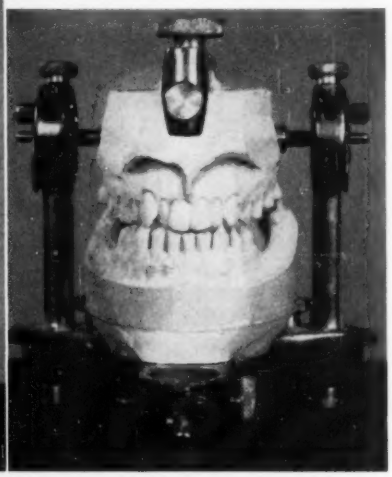


Fig. 4—Left: Articulation of stone models after operation. Below: Anterior view of articulated models after operation

Fig. 5—Profile view after operation

mandibular canal and approximately ½ inch from the cut edge of each segment. The segments were repositioned, and the wire sutures were tightened to stabilize the parts (Fig. 3). Rubber bands were applied to the arch bars for traction and immobilization. The wounds were closed with the use of no. 00 gut sutures through the subcutaneous tissues and no. 000 silk sutures for the skin incisions. The patient was provided special nursing care for 24 hours. The following day, the patient showed swelling of the face and submax-

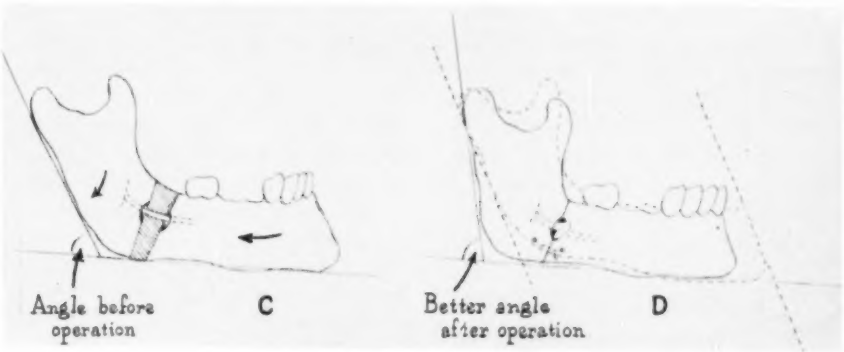
illary regions and had noticeable, but incomplete, paresthesia of the lower lip. The paresthesia resulted from manipulation of the nerve and was considered a normal postoperative finding. On the third day after the operation, silk sutures were removed. At this time, the patient was aware of a further return of sensation to his lower lip. Satisfactory immobilization was provided by the intermaxillary elastics.

The rubber bands were removed and mandibular movements were noted after three weeks. The healing appeared to be normal. The fixation appliances were removed after six weeks, at which time the paresthesia had almost disappeared. Artificial stone models were made and articulated in the newly established occlusion (Fig. 4). The patient was discharged on April 20, with instructions to continue eating soft foods for at least 30 days and to return for further evaluation of postoperative results in six weeks.

The patient was readmitted on May

First stage of operation

Second stage of operation



Final diagrammatic repositioning of the mandible

Fig. 6—Stages of operative procedure

28, at which time it was seen that the lower anterior teeth had moved forward slightly. This movement appeared to be the result of increased tongue pressure brought to bear on the teeth by crowding of the tongue into the smaller space created by repositioning the mandible.

It was necessary to reduce the incisal edges of the lower anterior teeth in order to correct centric occlusion and eliminate traumatic stress on these teeth.

To prevent further displacement of the lower anterior teeth and to establish a balanced occlusion for the posterior teeth, a chrome cobalt labial bar appliance with attached acrylic resin onlays for the bicuspid teeth was designed and inserted as a temporary measure until orthodontic treatment could be made available at a later date.

Postoperative photographs were taken just prior to discharge, on June 1, 1951 (Fig. 5).

■ *Summary*

1. It is believed that in this case ostectomy was the method that involved the least risk.

2. The mandibular segments were brought into ideal relationship with the maxillary teeth without the loss of teeth or the severance of the inferior dental nerves and vessels.

3. A better angle of the mandible was established with ostectomy rather than osteotomy (Fig. 6C and D).

4. Winter arch bars with elastic traction provided adequate fixation.

5. Heredity was no doubt the most important causative factor in this case of prognathism.

6. After two months, normal sensation returned to the lower lip and soft structures; the tired feeling of the temporomandibular joints following meals disappeared.

■ The Occupation of Life

Life is occupied in both perpetuating itself and in surpassing itself; if all it does is maintain itself, then living is only not dying, and human existence is indistinguishable from an absurd vegetation.—*Simone de Beauvoir, "The Ethics of Ambiguity."*

Thiopental sodium and thiamylal sodium: their usefulness in the office practice of oral surgery

■ *Edward C. Thompson, D.D.S., and David C. Hazard, D.D.S., Urbana, Ill.*

The search for a satisfactory method of preventing pain in dentistry never ceases. New agents and methods must be investigated, and proved methods scanned to judge whether patients are being served in the best possible fashion. This paper is an examination of the worth of thiopental sodium, which now is a widely and successfully used anesthetic agent for oral surgery. The pharmacologic effect of the drug has been reviewed adequately by Adriani,[1] Mousel, Johlin, Allen and others. It must be remembered, however, that depression of respiration and laryngeal spasm are the two objectionable traits that may be observed during its use. Also, since it is essentially a hypnotic drug, occasionally control cannot be obtained without adjuvants.

We have stated elsewhere[2] that one should master administration of gaseous anesthetics before undertaking the use of intravenous technics, and Krogh[3] has outlined a method of study for "those who are trained in the use of general anesthesia." The method he described is widely used in office practice and takes advantage of the upright position of the patient. The chair is adjusted with the seat inclined backward and the back rest straight, to keep the patient from sliding down and forward. The head rest is placed so that the occlusal plane of the lower teeth is parallel to the floor when the mouth is open. The resulting position of the head keeps the tongue well forward and aids airway maintenance. Another salient feature of this technic is the placement of a barricade consisting of a lightly rolled cylinder of cotton about 3 inches long and 1 inch in diameter midway on the dorsum of the tongue. It is not intended as a "pack" to keep air away from the throat. Supplementary gauze is used as an absorbent and discarded when necessary.

After induction, the operator determines anesthesia depth by checking the lash reflex. If the reflex is too active, additional thiopental sodium is given before the operation is started, with fractional amounts thereafter. Krogh pointed out that it is necessary for the oral surgeon to know the action of the drug thoroughly, and, since only he knows which regions are likely to be painful, and when he will

From the department of oral surgery, Carle Memorial Hospital and Carle Hospital Clinic, Urbana, Ill.

1. Adriani, J. The chemistry of anesthesia. Springfield, Ill., Charles C Thomas, 1946.

2. Thompson, E. C., and Sleeper, H. R. General anesthetic methods with special reference to thiopental sodium. J. Oral Surg. 8:121 April 1950.

3. Krogh, H. W. Use of thiopental sodium in dental surgery. J. Oral Surg. 5:337 Oct. 1947.

finish, he must advise the anesthetist so that the depth of anesthesia is never greater than required. He must assist in airway maintenance by keeping the head and tongue and lower jaw in proper position.

The main, and extremely worthwhile, advantage of the method is that the tongue and jaw do not fall backward, as frequently occurs when the patient is supine. A supplementary advantage is that, since the mouth is not packed for exclusion of air, the pharyngeal reflexes are not overly stimulated, and, therefore, a lighter plane of anesthesia may be used. The patient is kept in a state beyond analgesia and in a state of amnesia, but as Krogh stated, he certainly is not anesthetized in the sense accepted by the general surgeon. A physical disadvantage is that the surgeon must adjust his stance to a somewhat awkward position when operating on the posterior maxilla, especially if he is tall. This is a good method, though it frequently must be supplemented with nitrous oxide and oxygen anesthesia if the operation is prolonged.

The main disadvantage is that thiopental sodium causes the "signs of depth" to be masked; overdosage, producing histotoxic cerebral anoxia without evident anoxic anoxia, can occur, thus causing sudden respiratory failure. Decreased respiration, arterial pressure and heart rate are delayed in appearing, but may occur suddenly.

■ *Thiopental Sodium Analgesia with Nerve Block*

Balanced anesthesia for long, technical and bloody operations on the jaws, performed with the patient either in the upright or supine position, can be accomplished by the following method:[4]

Forty-five minutes to one hour preoperatively the patient is given 1/6 grain (10 mg.) of morphine sulfate, with 1/150 grain (0.40 mg.) of atropine hypodermically. Slow injection of 2.5 per cent solution is started; when 5 to 8 cc. has been administered, the region to be operated on is blocked with 2 per cent procaine with a relatively high epinephrine content. A Bullard open-type mouth prop facilitates swinging the syringe laterally when a mandibular block is being done. Any type of prop may be used for the various maxillary blocks. Blocking is done rapidly and, because of the narcotic effect of the thiopental sodium, no ill effects are observed. A light barricade pack is placed on the tongue and the operation begun. At this point 1 to 2 cc. of solution may be required to allow immediate operation. Once the operation is controllable, no more drug is administered until the patient perceptibly rouses; then it is well to stop operating for a minute and administer an additional 1 to 2 cc. of thiopental sodium. Thus the operation is carried to completion. This is a relatively safe method for major operations on apprehensive patients.

Though initially the patient is anesthetized in a light plane, as the operation progresses he is so "light" that there is little respiratory depression. It is not desirable to supplement further with nitrous oxide or oxygen, as this would unncessarily increase the tendency toward hemorrhage.

4. Thompson, E. C. Continuous pentothal sodium analgesia with nerve block, in oral surgery. An analysis of 100 consecutive cases. J. Oral Surg. 3:205 July 1945.

The advantages of using thiopental sodium with nitrous oxide, methods of administration and contraindications for its use have been published many times and were covered fully in the April 1950 issue of the *Journal of Oral Surgery*.[2]

■ *Thiamylal (Surital) Sodium*

Thiamylal sodium (Surital), a new product, similar to thiopental sodium, differs from the latter in the substitution of an allyl group for the ethyl side chain. It was suggested from laboratory studies on dogs by Kelly, Shideman and Adams[5] that thiamylal sodium was more potent and less stable than thiopental sodium. They administered standardized doses of the two drugs and compared blood levels at the time of the return of the righting reflex of the dog. They found thiamylal sodium to be 139 per cent as potent as thiopental sodium. The shape and slope of the blood level curves for both drugs were found to be similar, indicating approximately equal rates of detoxification. In a more recent study, Wyngaarden and coworkers[6] showed thiamylal sodium to have a potency of 1.5 as compared with 1.0 for thiopental sodium, based on the length of anesthesia from the onset of unconsciousness until the dog was able to stand erect after intravenous administration of the drugs. These workers found that thiamylal sodium produced a more rapid induction of anesthesia than thiopental sodium, with fewer signs of excitement and a more rapid recovery. Their studies on laryngeal reflex activity in cats showed no advantage in the use of one drug over the other. There was a definitely lower rate of accumulation of thiamylal sodium as based on duration of anesthesia after repeated doses of the drug. They expressed the opinion that the rate of accumulation is a function of the total dose administered, the more potent drugs requiring smaller doses and hence shorter time for detoxification. This latter factor is desirable for clinical anesthesia. Woods and associates[7] studied the cardiotoxic effect of these drugs in heart-lung preparations as well as in intact dogs, employing cardiac output, impairment of cardiac reserve and cardiac failure as indexes. They have demonstrated that, in equivalent doses, thiamylal sodium is perhaps less, but definitely not more toxic than thiopental sodium.

For comparison of its effect with that of thiopental sodium, in 100 consecutive cases, 2.5 per cent thiamylal sodium was substituted and given in conjunction with nitrous oxide-oxygen. The cases chosen were ones requiring fairly prolonged anesthesia, mainly impactions and alveoplasties. It was found that about 20 per cent less drug was required for induction. (Inductions averaged about the same length of time as with thiopental sodium.) Thus, it seems that thiamylal sodium is definitely a more potent agent. Maintenance of the surgical plane required about 10 per cent less thiamylal sodium than thiopental sodium. There was no evident difference in respiration or circulation that could be detected clinically during main-

5. Kelly, A. R.; Shideman, F. E., and Adams, B. J. Comparison of blood levels of thiopental (Pentothal), 5-allyl 5-(1-methylbutyl)-2-thiobarbituric acid (Surital) and thioethamyl in the dog. Fed. Proceedings 7:233 March 1948.

6. Wyngaarden, J. B., and others. Anesthetic properties of sodium 5-allyl-5-(1 methylbutyl)-2-thiobarbiturate (Surital) and certain other thiobarbiturates in dogs. J. Pharmacol. & Exper. Therap. 95:322 March 1949.

7. Woods, L. A., and others. Cardiovascular toxicity of thiobarbiturates. Comparison of thiopental and 5-allyl-5-(1-methylbutyl)-2-thiobarbiturate (Surital) in dogs. J. Pharmacol. & Exper. Therap. 95:328 March 1949.

tenance. Tendency toward laryngospasm could not be evaluated accurately. Three rather severe spasms occurred with pronounced cyanosis, but the patients admittedly had a strong predisposition to spasm. There were no others. The average induction amount was 12.29 cc.; the total dose was 25.09 cc. The average anesthesia time was more than 20 minutes. The shortest time was four minutes and the longest was one hour. Red and white blood cell counts and hemoglobin determinations, preoperatively and postoperatively, were of no significance.

Recovery was definitely superior. Many patients assisted themselves from the table, and all required less postoperative care and observation, though two of the patients (both hypersensitive young women) vomited in the recovery room and at home for two or three days.

Thirty additional patients were operated on and thiamylal sodium was the sole anesthetic used. We found no appreciable difference between it and thiopental sodium, except that slightly less drug was required and recovery was a little more prompt.

Our short experience with thiamylal sodium leads us to believe that it may have a place in oral surgery, primarily because its shorter recovery time should be valuable in office practice.

■ *Summary*

There has been a great deal of pointless discussion about "the office use of general anesthetics," particularly thiopental sodium. Criticism of the dentist who incompetently uses general anesthesia is, of course, justified, as is criticism of the physician who does the same. The simple fact is that there is wide variance in the competence of operators. Danger is implicit in surgery, and everyone is aware of it. The dentist frequently operates in full view of the public and not in the sanctity of the operating room. It is not generally realized that, in most cities, anesthesia is induced as often in dental offices as in hospitals. Since patients fear dental operations as much or more than they do other surgery, they are certainly entitled to general anesthesia in either instance. It is the exceptional hospital that possesses all equipment for safe anesthesia usually found in an oral surgery office where general anesthesia is properly used.

It is necessary, of course, that the surgeon achieve competence, utilize the best available agents and methods and be eternally studious.

■ Leisure

Leisure, it must be clearly understood, is a mental and spiritual attitude—it is not simply the result of external factors, it is not the inevitable result of spare time, a holiday, a week-end or a vacation. It is, in the first place, an attitude of mind, a condition of the soul.—*Josef Pieper, "Leisure, the Basis of Culture."*

Recognition and management of bleeding disorders in oral surgery

■ *James T. Howell,* M.D., and Raymond W. Monto,† M.D., Detroit*

Over 25 per cent of the last 250 cases of hemorrhagic diseases seen at the Henry Ford Hospital were referred to the hematology department by the oral surgery group. It is the purpose of this article to discuss the current concepts of the diagnosis and treatment of the hemorrhagic diseases.

Hemorrhagic diseases may represent defects in the blood vessels themselves; they may stem from an abnormality of the cellular elements of the blood; or they may result from defects in the chemical or hormonal components in the blood coagulation mechanism. Therefore, the doctor must evaluate each of these possible sources of bleeding disease in the patient through study of the medical history, through examination of the patient, and then through laboratory confirmation of the etiological mechanism. It is only after accurate diagnosis that he can appropriately consider the proper therapy for the patient.

■ *Factors in Hemostasis*

In order to understand the mechanisms of bleeding disease it is necessary to know the factors which insure hemostasis in the healthy individual. Some of these factors are (1) the tone of the tissues into which the bleeding occurs; (2) the integrity of the blood vessel wall; (3) the pressure in the vascular system; (4) the constituents of the blood which are responsible for its coagulation.

If bleeding occurs into a tightly bound cavity, bleeding will cease when the cavity is filled, irrespective of the integrity of the other factors of the blood clotting mechanism. Manipulating or opening this closed cavity may start the bleeding anew. Bleeding into the body tissues will cease shortly if the connective tissues are strong and can equalize the extravascular pressure. Thus, poorly nourished or diseased body tissues permit the loss of large amounts of blood when the vessels are traumatized. To some extent the tissue pressure directly on the wall of the blood vessel aids in controlling bleeding. By the same token, major blood vessels whose pressure is normally high are a more serious problem in hemorrhage than the secondary vessels which nourish the general body tissues. Moreover, systemic hypertensive vascular disease promotes more serious problems in hemorrhage throughout the vascular tree.

When tissue tension is deficient and cannot promote hemostasis, purpura, ecchymoses and hematomas occur even when the bleeding time and capillary

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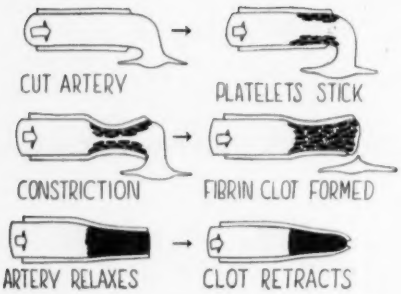


Fig. 1—Schematic representation of vascular function in hemostasis

resistance as shown by the tourniquet test are fairly normal. Further, it has been adequately demonstrated that neither platelet thrombi nor fibrin clots form within the small vessels of capillary and precapillary size, yet platelet plugs characteristically seal the defect in vessels over 55 micra in diameter. It is an inherent property of an injured blood vessel to constrict when traumatized and to retract when severed. Needless to say, vascular contraction is vital in hemostasis but it is important to note that the platelet plug is insufficient to stop bleeding when this vessel wall characteristic is lost (Fig. 1).[1]

The foregoing factors are the most important in hemostasis when the bleeding is associated with minor trauma of vessels of small size and in tissues of considerable tension such as normal skin and muscle. The coagulability of the blood itself, on the other hand, is more important in the bleeding from vessels of the viscera and mucous membranes because of the reduced tissue tension and the presence of relatively large thin-walled vascular channels in these structures. The mechanisms of the coagulation of blood as they are known today are as follows:

A platelet enzyme or thromboplastinogenase is thought to activate the thromboplastinogen in the blood plasma to the formation of thromboplastin. Thromboplastin unites with prothrombin in the presence of calcium to form thrombin. Initially this latter conversion proceeds slowly, but it establishes an autocatalytic mechanism known as the serum prothrombin accelerator which speeds the conversion of thrombin. Finally, thrombin reacts with fibrinogen to form fibrin.

■ *Clinical Recognition of Hemorrhagic Syndromes*

An oral surgeon, knowing the basic facts operative in normal hemostasis, must be able to recognize clinically the hemorrhagic syndromes. He must evaluate each of his patients in this respect. Certainly some of the patients will give no clue of a hemorrhagic disease, many will allege to "easy bruising" or "prolonged bleeding," a few will have an established diagnosis of hemorrhagic disease and some will have a bleeding oral lesion at the time of their initial visit. In the hematology clinic of the Henry Ford Hospital, only 20 per cent of the patients seen for evaluation of bleeding actually have a disturbance of hemostasis. A careful appraisal of each patient will eliminate much of the need for hematologic consultation.

The duration of the bleeding is of obvious importance. Significant bleeding

1. Seegers, W. H., and Sharp, E. A. Hemostatic agents; with particular reference to thrombin, fibrinogen and absorbable cellulose. Springfield, Ill., Charles C Thomas, 1948, p. 29.

usually is continuous and of short duration; that is, days rather than weeks. Intermittent bleeding every few days over a period of several months and lasting only one to two minutes usually does not connote a serious bleeding problem. The amount of bleeding has to be evaluated. It is human nature to exaggerate the quantity of blood which is lost. To be sure, the blood is mixed with the secretions of the mouth, obviously increasing the true volume of the lost blood. To place some estimate on the quantity of bleeding is only a crude estimation at best, but some attempt should be made to measure it. If the bleeding has been only flecks or streaks in the salivary secretions, little significance can be attached to it, but larger quantities assume greater importance. The patient may be questioned about a "tablespoonful" or a "cupful" of blood, or whether he used a towel for expectoration, or whether he used a box of Kleenex in one day. Children notably swallow blood and hence a question about the vomiting of blood is apropos. The type of bleeding is a factor to be considered. The first thing to determine in this category is whether the bleeding began spontaneously. Often this is more serious in nature than bleeding after trauma or an operative procedure in the oral cavity. Again, continuous bleeding often is a more dire type of bleeding than intermittent bleeding of longer duration. Briskly bleeding bright red blood indicates arterial bleeding of local origin, while dark red oozing type of bleeding is most often a serious omen of systemic disease. Bleeding that suddenly begins three to four days after an operative procedure usually is due to local causes. Frequently this can be ascribed to the premature separation of the clot resulting from motion of the mouth or from some additional trauma or infection. But the bleeding in the male which begins four to six hours after a procedure and is of the oozing type is serious because it is a characteristic of hemophiliac bleeding.[2] When the bleeding continues throughout the night a great deal more significance can be placed on the likelihood of systemic disease than if the bleeding occurs only during the daytime. It is necessary to determine whether there have been previous episodes of bleeding or if there has been abnormal bleeding associated with previous trauma or surgical procedures. Former need for transfusions is valuable information as to significant bleeding. The presence of symptoms of anemia is important. These would include weakness, light-headedness, dizziness, palpitation and shortness of breath on exertion.

The presence of serious bleeding usually is manifest in multiple organ systems. Therefore it is important to know about concomitant or previous bleeding from locations other than the mouth. Purpura or ecchymoses of the skin, epistaxis, gastrointestinal or genitourinary tract bleeding must be noted. The middle-aged, obese woman frequently alleges to have abnormal bleeding on the basis of "easy bruising" from minor trauma. This usually can be discounted because significant abnormal bleeding conditions most frequently are attended by mucous membrane hemorrhage.

A decision concerning systemic dis-

2. Quick, A. J. Management of hemophilia in general practice. J.A.M.A. 145:4 Jan. 6, 1951.

eases cannot readily be made by the oral surgeon. Often the physical appearance of the patient will give some indication of generalized disease. The patient may be under a doctor's care and it can be learned if he is receiving treatment for liver disease, heart disease, vascular disease or hemopoietic disease. Modern management of thrombo-embolic cardiovascular disease incorporates the use of blood anticoagulant substances such as dicumarol in ambulatory as well as hospital patients. Operative procedures on such a patient are hazardous.

It may be helpful to know the occupation of the patient. There may be an increase in disturbances in the normal mechanisms involved in hemostasis among persons working in industries where there is a greatly expanded use of chemicals such as solvents in the plastic and rubber industries and radioisotopes in other industries.

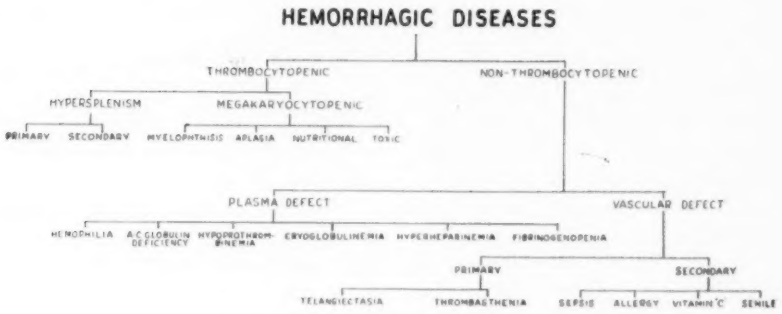
A careful family history of hemorrhagic diseases should be obtained from all patients who are subject to bleeding. This history should extend as far back in the family tree as possible and include all relatives as well as members of the immediate family. Particular attention must be paid to the sex of each bleeder since hemophilia is a disease of the male, while idiopathic thrombocytopenia purpura occurs most often in the female. Again it is necessary to assess the characteristics of each bleeding episode in the light of the foregoing discussion. Sporadic cases of hemophilia, as well as mild cases not readily recognized, are not infrequently encountered. Part of the family history should include a review of the systemic diseases to which relatives have been subject, particularly those in which bleeding has been a factor. For example, the family history may show instances of hypertension or liver disease.

After the interrogation of the patient, the physical examination is the next important step in the diagnosis of a hemorrhagic disease. Though it is not in the realm of the oral surgeon to complete a general examination, yet he can learn vital information from critical observation of the patient.[3,4] Initially, the general appearance of the patient is helpful. Evidence of weight loss, of poor nutrition or of a chronic illness should make one suspicious that a hemorrhagic tendency may be present. The skin and mucous membranes often will tell a great deal. The plethoric appearance of the face may denote polycythemia vera and, contrariwise, pallor may indicate anemia.

The yellowish tint of the sclera and of the skin may foretell jaundice from disease of the liver. Angiomas of the skin, lips and mucous membranes may indicate oral bleeding from familial telangiectasia. A hemorrhagic diathesis may manifest itself as purpura, ecchymoses, or petechiae of the skin or mucous membranes. The presence of enlarged lymph nodes in the neck may constitute evidence of a bleeding disease. The examination of the actual bleeding site is extremely important. Blood arising from the nasopharynx, esophagus, or from an angioma of the roof of the mouth may be confusing but the site of the bleeding must be definitely established.

3. Klumpp, T. G., and Evans, T. S. Monocytic leukemia; report of eight cases. Arch. Int. Med. 58:1048 Dec. 1936.

4. Valentine, W. N. The diagnosis and management of hemorrhagic disorders. M. Clin. North America 36:1051 July 1952.



With this accumulated data, the oral surgeon can decide at this point whether his patient shows hemorrhagic tendencies. Any suspicion of bleeding characteristics requires evaluation and diagnosis by the internist or by the hematologist.

The hemorrhagic diseases can be separated into (1) the group which is platelet deficient or thrombocytopenic, and (2) the group in which there is either a vascular or a plasma defect (Fig. 2).[2] The thrombocytopenic group may result from abnormalities in the bone marrow production of megakaryocytes, from primary diseases of the bone marrow, or from associated diseases of the spleen. In the plasma group there are chemical or hormonal deficiencies in the blood coagulation mechanism, whereas in the vascular group there is a defect in the integrity of the vessel wall. This defect may be either primary or secondary to a general systemic disease.

There are three preliminary clinical procedures which the internist or hematologist often performs in his office: determination of the bleeding time and of the clotting time, and the capillary resistance test. By the history, the physical examination and these screening tests, he decides whether the following confirmatory procedures and determinations should be carried out: (1) hemogram (differential leukocyte count), (2) urinalysis, (3) stool examination, (4) stained direct smear, (5) platelet count, (6) prothrombin time, (7) modified 2-stage prothrombin determination, (8) accelerator globulin, (9) fibrinogen level, (10) liver function tests, (11) sternal marrow examination. A comparison of the laboratory results in various hemorrhagic diseases are shown in the table.

■ *Therapeutic Treatment of Hemorrhagic Disease*

Therapeutic treatment of the hemorrhagic disease may be divided into two large phases, symptomatic and definitive. The former connotes the arresting of the immediate symptoms, and elimination of the cause is indicated by the latter.

The treatment of a hemorrhagic disease by the oral surgeon is primarily the management of the bleeding site, hence is symptomatic. The definitive therapy of

Table

Correlation of laboratory findings in hemorrhagic diseases

Disease	Coagulation time	Bleeding time	Tourniquet test	Clot retraction	Platelet count	Prothrombin time	Ascorbic acid tolerance test
Vascular bed							
Hereditary hemorrhagic telangiectasia	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Hereditary capillary fragility	Normal	Prolonged	Variable	Normal	Normal	Normal	Normal
Scurvy	Normal	Normal	Positive	Normal	Normal	Normal	Positive
Henoch-Schönlein's syndrome	Normal	Normal	Variable	Normal	Normal	Normal	Normal
Senile purpura	Normal	Variable	Variable	Normal	Normal	Normal	Normal
Sepsis	Normal	Normal	Variable	Normal	Normal	Normal	Normal
Cellular							
Idiopathic thrombocytopenia	Normal	Prolonged	Positive	Poor	Decreased	Normal	Normal
"Symptomatic"	Normal	Prolonged	Positive	Poor	Decreased	Normal	Normal
Plasma							
Hypoprothrombinemia	Variable	Variable	Variable	Normal	Normal	Prolonged	Normal
Accelerator globulin deficiency	Variable	Variable	Variable	Normal	Normal	Prolonged (A-C globulin deficient)	Normal
Hyperheparinemia (protamine titration positive)	Prolonged	Normal	Normal	Normal	Normal	Normal	Normal
Hemophilia	Prolonged	Normal	Normal	Normal	Normal	Normal	Normal
Fibrinogenopenia	Prolonged	Normal	Variable	Normal	Normal	Normal	Normal

these diseases is effected in cooperation with the internist or hematologist.

There are three cardinal principles in the symptomatic management of bleeding, (1) rest, (2) application of cold and (3) application of pressure.[5] Strict adherence to these principles alone will alleviate a large percentage of abnormal bleeding states.

Mental rest for the patient is important. The judicious use of sedation will allay anxiety. Bed rest with the head elevated usually is mandatory. Quiet, orderly surroundings also will help. Needless movement of the patient from bed to office is to be avoided. The bleeding site must be immobilized. Obviously, continued motion will prematurely separate the clot and stimulate the return of bleeding. Conversation by the patient is to be limited. A liquid diet should be ordered.

The application of cold adjacent to the bleeding site causes constriction of blood vessels and may bring about a permanent clot. In bleeding that is of capillary origin, the application of cold often accomplishes more than any combination of therapeutic approaches because of continuous vasoconstriction. An ice bag to the face or ice chips in the mouth are helpful measures.

5. Doan, C. A. Etiology and management of hemorrhagic diatheses. Ann. Int. Med. 31:967 Dec. 1949.

Wherever pressure can be applied it will immeasurably assist in the control of bleeding. Suture of the gingiva with or without packing may be used after extractions. Firm pressure by the finger for 10 to 15 minutes will stop an episode of bleeding. Pressure, of course, must be used in combination with rest, immobilization and the application of cold.

Deep bleeding often simulates inflammation. Further, inflammation often precipitates bleeding, Heat, while commonly used in the treatment of inflammation, should not be applied to any patient who shows manifestations of hemorrhagic disease.

LOCAL MEASURES—Certain fundamental surgical principles are prophylactically important. There should be as little trauma as possible and hemorrhage should be controlled by precise operative hemostasis. Careful attention must be given to the viability of the tissues and the control of infections.

The local measures which can be instituted at the bleeding site are as follows:

1. Thrombin can be placed in the base of the bleeding site. Thrombin preparations are capable of clotting blood instantaneously. The manner of their application to the bleeding area is most important.[6] In order for thrombin to be effective it should be placed in contact with the bleeding capillaries of the wound (Fig. 3). Therefore, partially clotted old blood and debris must be removed. Then the thrombin is placed in the base of the bleeding site. Thrombin in solution may be applied in combination with absorbable hemostatic materials such as oxidized cellulose, absorbable gelatin sponge or fibrin foam. Though soluble, these substances will act as foreign bodies and hence unnecessary amounts of them are not advisable. The thrombin is soaked into one of these agents and after the correct preparation of the bleeding site, it is placed into the wound. Steady pressure will add a great deal to the effectiveness of the thrombin. If bleeding continues it suggests that an insufficient amount of thrombin is present, that the hemorrhage is from vessels too large to control by this method of hemostasis or that there is oozing from beneath an imperfect clot.

2. The preparations of thromboplastin are used in much the same manner as thrombin. Thromboplastin, as indicated earlier, interacts with prothrombin in the presence of calcium to form thrombin. Thus, some delay in clotting by using this agent may be anticipated, particularly so if there were depletion of other blood factors in the coagulation mechanism.

3. Certain snake venoms have been

6. Seegers, W. H., and Sharp, E. A. Hemostatic agents; with particular reference to thrombin, fibrinogen and absorbable cellulose. Springfield, Ill., Charles C Thomas, 1948, p. 31.

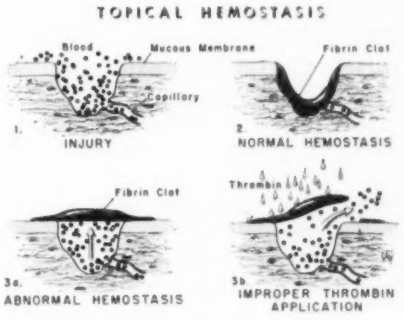


Fig. 3—Principles in topical hemostasis

used in the past as hemostatic agents. Their action is directly on fibrinogen and can be used locally.

4. Epinephrine has been used widely because of its vasoconstrictive action. Its action is transient and it must be applied directly to the site from which the blood is oozing.

5. Electrocautery can be useful when applied directly to the tip of a bleeding vessel. When extensive cautery is used, adjacent tissues may undergo necrosis and permit delayed bleeding in a susceptible individual.

6. In rare instances it may be necessary to ligate the external carotid artery for the control of hemorrhage of "local" origin.[7]

SYSTEMIC TREATMENT—There is no substitute in major bleeding episodes for a transfusion of fresh whole blood. While plasma does contain necessary increments for the coagulation of blood, fresh whole blood transfusions will re-establish blood volume, provide cells, platelets and more potent coagulation factors. Antihemophiliac globulin affords no therapeutic advantages over fresh blood or plasma and in addition carries the additional risk of homologous serum hepatitis. Transfusion of platelets is a recently perfected technic in the treatment of blood diseases.

Rutin and ascorbic acid are medicaments which are of value to counteract the vascular effects of certain hemorrhagic diseases. It has been shown that protamine sulfate increases coagulability, probably by affecting the ionic structure of circulating heparinoid substances in the blood.

Increase in blood heparinoid substances is believed to result from multiple blood transfusions rather than from the basic disease under therapy. Adrenocorticotrophic hormone and cortisone have a nonspecific action in alleviation of abnormal bleeding of vascular origin as well as a specific response in cases of idiopathic thrombocytopenic purpura.

When deficient prothrombin formation or activity can be proved to be the source of hemorrhage, administration of vitamin K can be effective therapy. The routine prophylactic use of vitamin K in bleeding problems cannot be rationalized. Lowered blood calcium levels of a degree to affect the coagulability of blood are not compatible with life. The use of calcium parenterally or orally is of no value. Herb preparations for oral use have no proved power to increase hemostasis. Vitamin B preparations and oxalic acid fall into the same category.

■ *Summary*

A comprehensive medical history must be taken and a searching physical examination made in order to reach an accurate diagnosis of the hemorrhagic disease. Proper treatment requires a precise diagnosis. The basic principles of rest, application of cold and pressure are useful in the primary management of a bleeding problem. Systemic therapy depends on an intimate knowledge of the disease pattern.

It is recognized that hemorrhagic diseases frequently manifest themselves in the oral cavity. Many of them can be managed by the oral surgeon but others will require the cooperative assistance of an internist or hematologist.

7. Hallberg, O. E. Severe nosebleed and its treatment. J.A.M.A. 148:355 Feb. 2, 1952.

Remarkable tolerance of tissues to a foreign body

■ *Albert H. Throndson, D.D.S., San Francisco*

Roentgenographic examinations occasionally reveal the presence of foreign bodies in the tissues without evidence of infection or tissue changes. The question rises as to whether all such objects should be removed as a prophylactic measure, or should they be noted and allowed to remain undisturbed until symptoms appear that demand their removal. Why, in some instances, do acute infections develop around some foreign bodies after extremely long periods of quiescence? Is it possible to establish criteria which will be a guide in determining when surgical intervention is best and when the condition should be watched and ignored?

Several factors, singly or together, cause immediate or delayed reaction in the tissues. The first is infection introduced by or with the foreign body; then there is the nature of the substance constituting the foreign body which may produce inflammation followed by infection. The products of solubility, electrolytic action and the irritating effect of the dissolution may cause cell degeneration and death of tissues locally to a degree that prevents the complete absorption and elimination of the irritating material. If this occurs gradually enough, the tissues may lay down a barrier of connective tissue, a so-called walling off. This condition usually can be recognized in roentgenograms. If the process is rapid, however, infection, inflammation and pain result. Roentgenographic evidence is not found during the early acute stages but soon follows. When the foreign material is sterile, essentially insoluble and but slightly reactive to tissue fluids, the body tolerates it very well. Tantalum, Vitallium and polyethylene, for example, produce practically no reaction and because of this are useful in reconstructive surgery.

If an infection develops on the introduction of a foreign mass and subsequently subsides without removal of the intruder, does it mean that there no longer is infection present or that it will not recur?

■ *Case History*

The following case history is interesting because of the exceedingly long period of symptomless toleration.

On May 20, 1948, a woman aged 72, white and in good health, came for examination. She complained of pain in the region of the right maxilla. History revealed that she had fallen and punctured her cheek with a slate pencil at the age of 12. At the time she became ill, with considerable facial swelling and fever. This was followed by spontaneous rupture of an abscess and complete recovery. The pa-

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Fig. 1—Intraoral roentgenogram showing small area of increased density

tient insisted that the pencil was not broken at the time and that there had been no symptoms until the present.

Examination disclosed a partially edentulous mouth in good condition. There was tenderness to pressure in the region of the right maxillary tuberosity but no facial asymmetry was evident. Intraoral roentgenograms revealed a small area of increased density at the superior posterior margin of the film (Fig. 1). The object was readily visualized in its entirety in a lateral jaw roentgenogram but could not be localized in the posteroanterior view since its density appeared to be only slightly greater than bone and considerable superimposition was evident. Its dimensions were approximately 2.5 by 1.0 cm.

Ten days later there was evidence of moderate swelling anterior to the ear and extending from the zygomatic arch to the level of the occlusal plane of the lower teeth. The region was exquisitely tender and fluctuation was apparent.

Because of the clinical findings and because of the roentgenographic evidence of a foreign body, it was decided to explore the region and attempt removal of the foreign material.

Using 2 cc. of 2 per cent procaine with epinephrine 1:50,000, an injection was made through the greater palatine foramen well into the pterygopalatine canal. Almost immediately the pain subsided and some ischemia over the zygomatic eminence and infraorbital regions was noted. An incision was made in the mucobuccal fold of the vestibule beginning at a point overlying the roots of the upper first molar, thence posteriorly to a point behind, lateral to, and above the tuberosity. Then, by blunt dissection, the tissues were opened until a discharge of purulent material occurred. A considerable amount of granulation tissue was removed and the wound packed for a few moments to control hemorrhage. Careful probing brought out a very small fragment of black material of the appearance of graphite. The foreign body was finally felt by passing an instrument along the lateral aspect of tuberosity of the maxilla and thence into the space immediately adjacent to the lateral surface of the lateral pterygoid plate of the sphenoid bone. The object lay partially on the outer surface of the maxilla and partially on the outer surface of the lateral pterygoid plate of the sphenoid bone (Fig. 2). Fibrous tissue around the object was dissected free making it possible to withdraw it. Examination proved it to be the writing end of a slate pencil measuring $1\frac{1}{16}$ inches long and $\frac{3}{16}$ inches in diameter. The wound was

dressed with penicillin insufflation and a two inch length of ¼ inch gauze was placed into the wound as a drain. The wound was closed with interrupted dermal suture. The sutures and drain were removed on the sixth day. Paresthesia and some loss of motor function of the right half of the upper lip and the right infraorbital region were present immediately after the operation, but there was partial recovery from this complication one week postoperatively. Improvement continued and all symptoms disappeared within 21 days. There has been no complaint since that time.

■ *Comment*

This case raises the question as to whether the infection had been present continuously in a chronic low-grade state over the 60-year period, a so-called focus of infection, or had there been a new blood-borne infection that had invaded a region of low resistance. If the first were the case, why the sudden exacerbation at this late date? And if the latter hypothesis is correct, why did 60 years elapse without some transient blood-borne infection exciting it? It is hardly possible to escape the conclusion that a low-grade infection was present continuously.

All factors must be considered before a decision is made as to whether or not to remove a foreign body. Certainly, in the case cited, few would have suggested the removal of the object had it been discovered by chance before symptoms occurred. It would justifiably be thought that after so long a time with a negative history, and with the patient's normal life expectancy of only a few years, the procedure would be unwarranted. On the other hand, if the patient were a young person, I would strongly advise its early removal as a preventive measure.

Fig. 2—Showing object on the outer surface of maxilla and partially on outer surface of lateral pterygoid plate of the sphenoid bone

When the clinical history is relevant, the operator's course is easier since previous infection associated with a foreign mass would make him hesitate to ignore it. Obviously, then, when infection is present, all foreign bodies should be removed unless the patient's health mitigates against surgical intervention. Foreign bodies, even when not bearing infection, should be removed from young individuals as a preventive measure, unless this surgery jeopardizes an otherwise healthy organ or part. In patients of advanced years, absence of symptoms would suggest watchful waiting rather than early operative interference.

Quo vadis

■ *Richard H. Lyons, M.D., Syracuse, N. Y.*

I am grateful for the honor that the American Society of Oral Surgeons has accorded my father by initiating a Chalmers J. Lyons Memorial Lectureship as an integral part of the program of the Society. No higher compliment can be given to any man than to be remembered in this way by his colleagues. As a son I share with his students this reflected glory and take this opportunity to express my appreciation of the action. Also, I am grateful for the honor that has been accorded me by asking me to be the first lecturer.

A memorial lecture is a challenge to the speaker, for such a lecture is a form of hero worship. We contemplate in simple piety the greatness of minds beyond our own, and find inspiration from the past battles successfully entered and heroically won. When I was offered this opportunity I accepted with enthusiasm, for seldom does a son have such a chance to honor his father. I began to search for a suitable subject that would not only be fitting as a memorial to my father but be of interest and bring new ideas to his colleagues. Research problems in metabolic or vascular disease that would bring new ideas could be discussed, but would that be a fitting topic for this first lecture? I thought not. I then considered the things that you and I and my father have in common. There are many things, among them a deep and enduring respect for the specialty of oral surgery and the profession of dentistry. Physicians and dentists share the same professional attitude in that we are dedicated to the service of the people and to the relief of suffering. We are dedicated to the opportunity of service above secular gains. We have been educated beyond the usual level and we recognize our debt to society for having had these opportunities. In this recognition, we express our devotion to the educational process both as undergraduate students, graduate students and now as continuing students.

Chalmers Lyons was a pioneer in the field of oral surgery and brought to it many important technical advances for which he received appropriate recognition. Nevertheless, I am sure that he felt throughout his life that he received the greatest personal satisfaction and gratification from his students to whom he was deeply devoted, as they were to him. Thus today we are honoring a man whose life was devoted to students more than to the subject of oral surgery. He, as a teacher, made them think, and by example he showed them the importance of the professional attitude of one dedicated to the service of his fellow men. Thus he accomplished a multiple purpose. Not only did a student learn a subject but he also saw a daily exemplification of a profession

Chalmers J. Lyons Memorial Lecture delivered before the American Society of Oral Surgeons, October 10, 1952.

Professor of medicine, State University of Medicine, Syracuse, New York.

and an example of what a profession could mean to him.

It seems, therefore, not inappropriate that we try to define some of the attributes of his life so that we may bring to our lives some of the meaning he had in his. It may be impertinent for a son to analyze the factors in a father's life that led to the honor and devotion he achieved from his students and colleagues. This impertinence may be excused, however, if from such an analysis we can achieve sustaining ideals for ourselves.

As viewed from the lofty heights of knowledge today, the formal education of Chalmers Lyons must indeed have been a sorry affair. Fifty-four years ago, when he graduated from the University of Michigan, he had been exposed to anatomy, he had been taught metallurgy, had an empirical course in materia medica, and had been taught some of the operative technics of dentistry of the time. He knew little physiology, relatively no pathology, and no bacteriology or chemistry. The use of roentgenography in dentistry was just beginning. Orthodontics and sterile technics were unknown. After he graduated from dental school, he immediately began the practice of general dentistry. He eventually became dissatisfied with the intellectual challenges offered him in such a practice and he developed an interest in surgery of the mouth. His interest and talents as a graduate student in surgery were accepted at that time far more readily than they might be today, for he was able to apprentice himself with the professor of surgery at the University of Michigan and he assisted him in all of his operations about the mouth. Rather than enter the field of medicine, which might have been easier, he continued his study and interest in dentistry and after more than 15 years of constant struggle for self improvement subsequent to graduation, he was offered a newly established chair of oral surgery. At the same time, he was given the extraordinary opportunity to develop his own clinic in the University Hospital. At this time he was about 40 years of age and, in contrast to much of the thinking today, it is of interest that at this age his professional development began to accelerate. He learned more and accomplished more after the age of 40 than he had in his previous years. It was not until he was in his fifties that his contributions to the field of oral surgery were most effective.

There is no indication at the time of his graduation from dental school of the great potential he enjoyed in middle life. The years my father spent in general dentistry apparently were pleasant and at the same time scholarly. His development was slow and his ability not generally recognized except by his teachers, who favored him with intimate contact and who freely shared with him their wisdom and their clinical opportunities. His progress though slow was continuous, and brought about by personal sacrifice. There was less incentive in his day for further training than there is today and the idea of continuing education in dentistry for intellectual stimulation was considered extraordinary, though now it is fundamental in our professional responsibility. Somewhere in his early life he had developed an intense intellectual curiosity which called for continual study, a habit which he maintained to his death. Learning to him was a pleasant process.

Today the period of formal study for either dentistry or medicine not only is longer but infinitely more intense. Innumerable technical hurdles must be crossed if a degree is to be achieved. Technical courses today are conducted by teachers who are masters in their field but who often have little or no interest in the student of medicine or dentistry. When this is true, the subject becomes more important than the student and the student is left with the unpleasant task of assembling sufficient relevant and irrelevant facts to jump the hurdles placed for him by the teacher. When the harassed student who entered the profession because he liked people is exposed to a continual series of technical courses taught by technicians, each course unrelated to the other, he cannot help but wonder why he is there, and what meaning, if any, they have to him. The teacher may not be able to tell him. He seldom gets a chance to know the professional attitude because he may not meet it in this type of educational process. He is so involved with technics that he is not reminded of the importance of his work to people and the ethical basis of his education.

In any form of the acquisition of knowledge, one must distinguish between education and training. Training entails the accumulation of sufficient facts and skills to do useful work. Thus we may train a man to run a milling machine or a streetcar, or to perform an operation. He is a technician. Education, on the other hand, is a series of experiences that may be integrated into a deeper understanding of life. It involves the discipline of the mind in selecting the relevant facts of a problem and resolving the problem by constructive thought and imagination. Education offers us freedom from prejudice, a brighter understanding of the values of human behavior and environment, and a greater appreciation of our fellow men. It is a liberalizing process, never static. Perhaps at times all of us exhibit evidence of education, but too often we find it expedient to resolve our problems by standard behavior patterns rather than by facing them with thought.

Though a university is an educational institution, one should not necessarily expect its products to be educated after a short period of incubation in it unless special efforts are made to educate rather than to train the student.

Thus, the student of dentistry or medicine today who must master the many technical courses is in constant danger of becoming a technician rather than an educated man unless great pains are taken to make these courses experiences in constructive thinking. The technics generally are soon forgotten if unused but the discipline of thought remains. Education is said to be what is left over after what has been learned has been forgotten. It is an intelligent understanding and responsibility for a way of life that transcends all technical knowledge.

We have generally assumed that an education is something that is injected during a course of study and we assume that a university is able to turn out a professional man complete with all the trimmings, including a fine set of ethics of his profession. I now have enough gray hair so that I can listen to my older colleagues view with alarm the lack of that fine, delicately balanced ethical point

of view of a professional man among the latest graduates of professional schools, and listen to their comments that education isn't what it used to be. Let us remember, however, the old begin to complain of the young when they can no longer set a bad example.

Too often at the completion of university training, our education stops, and we worship at the clay feet of fleeting technical procedures. In these times when the roots of our professions are being threatened by social pressures we should examine ourselves in terms of our own continuing education as a professional man. Have we become technicians or are we continuing to add to our intellectual equipment? The dedication of our professions to the service of humanity involves a responsibility for scholarship and continued learning that does not permit a retreat into technological methods or into accumulation of irrelevant facts. Facts, like technics, are made to be used, and unless they serve a function of improving life they wither and die.

Education, then, in the health sciences cannot be technical information alone, but an understanding that, after acquiring the basic technical tenets, each student must devote himself to a lifetime of further scholarship that stops only with death. When such an educational attitude does not prevail, the students quickly fall into standard patterns of behavior of the surrounding social mores and not only lose the ideals of the profession but block its progressive growth.

Too often our institutions, rather than the students, are at fault. They fail to transfer the fine ideals of a profession to the student. Such institutions, at the same time, fail in their educational mission and turn out a trained product to do repetitive tasks rather than a product of disciplined mind who has the capacity and desire for change, an understanding of his fellow men and an understanding of his ethical responsibility.

The teaching of technical subjects is not incompatible with education. There are many well educated scientists who have achieved superb technical skills but who use these skills as tools with which they seek further knowledge. Courses from such men are educational, for the value and purposes of the technic are secondary to the purposes of learning, the discipline of thought and the greater horizons that may be opened. Medical and dental education is a preparation for a life consecrated to society, fulfilled through the medium of technical detail which is put to useful work for our fellow men.

How, then, can we insure in future generations the high professional standards we have today? The answer is clear. It is through the careful selection of teachers. We do not need courses in character but rather teachers with character. Too often shallow administrators try to fill intellectual holes in a curriculum with new courses given by the narrow men who permitted the holes to develop. If one wants to improve education, the effective way is not to tinker with the machinery but to strive continually to achieve able teachers, men with a passion both for scholarship and for teaching, and let them teach in their own way. There is no substitute for professional competence but good teaching does not stop there; it not only requires a thorough

knowledge of the subject but a sympathetic understanding of the student and of the world in which we live. No profession can be developed by technicians, nor can we trust them to maintain the ideals. The teacher develops character in his students which is a reflection of himself. The student may learn superficiality or responsibility, morality in dealing with fellow men or immorality, honesty or dishonesty and good ethics or no ethics. In the same sense, the need for continuing education cannot be preached but must be illustrated by the continuing intellectual growth and creative attitude of the teachers, so that the spirit of learning is transferred to the student. It is like a contagious disease that is easily transferred in epidemic proportions by those so infected to the youth they contact. The best quality of teaching is the creative activity of the staff. Unless one does independent thinking and research, how can one transfer to the student the emotions and heartaches that have gone into the establishment of any principle. It is only in this way that the teacher, from his own intellectual curiosity, may inspire the students with the pleasures as well as the benefits of learning.

Every member of our professions must be a teacher, for regardless of the excellence of a student's exposure to high ideals and high standards of workmanship at the beginning of his career, the pitfalls are many and we must sustain each other in the development and maintenance of the highest ideals of service. The problems of time, intellectual apathy, economic extravagances, the very attitude of our free society in general, all serve to take from us these ideals which we accept and cherish as a part of our way of life.

It is unfortunate that some of us fall into the trap of considering the university experience the beginning and end of our technical and educational effort. College days represent one twentieth of our professional effort, and though they may be of directional significance, they represent only the beginning of professional life, not its flowering. Some believe that because they were not academically outstanding as undergraduates, the quest for new horizons must be left to those who are more brilliant and, therefore, they retire too early from the battlefield of ignorance to the swamps of apathy and security as technicians. This attitude is one of the great misfortunes in our professions today. The opportunities for further advance under good teachers generally go to those with ability that exhibits itself at an early age, while those whose ability arises more slowly are denied these immediate challenges. It is harder for them to express their ability through lack of the proper opportunity. When it finally reaches expression it has been won by intelligence and perseverance against many handicaps. These are the men who in the end give our professions more strength and stability than the brilliant intellects who are nurtured to incandescent heat only to fade. Unfortunately, because of the intensity of the educational process, those whose ability is apparent during their university period are selected for the further intensive study while those with slower but perhaps greater potential may tend to dissipate their abilities in the practice of their profession. More opportunities for advanced study must be es-

tablished for these men of slowly developing ability. Today we tend to discourage such slowly developing ability from finding expression in our academic groups and snuff out the talents of those who could make important contributions.

There is no place for discouragement in this educational process of a professional man, for who knows at what age in life a set of intelligently achieved observations will lead to radical changes in our lives? None of us can pass to others the responsibility of the battle with the unknown. Each must accept it as part of professional life, add his attack, be it at the moment small, and continue to work with an educated intelligence, intellectually honest, curious, humble, adaptable and imaginative.

We honor through this discussion a man who might be called a pioneer in the field of oral surgery, but in his task of pioneering he was a slow starter. He did not exhibit the brilliance of some of his classmates, but he had a high degree of intellectual curiosity and a capacity for continued striving for facts in the special field of his interest. Through this continued scholastic effort, his ability was gradually recognized and a special department was established in the dental school, the medical school and the hospital to further the search for information in the field of oral surgery.

His students will agree that his appointment advanced dental education more than did the partitioning of the department of operative dentistry. He was able to bring to the students a humble approach to life, with intellectual curiosity and honesty supported by scholastic ability and an enthusiasm for learning that was contagious. No doubt it was this infectiousness that motivated the establishment of this lectureship.

Today the education of a professional man is not substantially different from what it was for Chalmers Lyons; only the content and detail is different. We are pioneers in the same real sense that he was and we can no more depend on others to do the work than could he. If our professions are to survive we must be educated men and as such recognize our duty to continue the study of the ever-changing natural phenomena as they are seen from the heights of observation currently available. Our teaching must prepare us for change not only in professional relations but also in the basic concepts of scientific knowledge.

As more of the secrets of nature and disease are revealed to us there certainly will be further changes in our fields of interest, greater partitioning of departments, more detailed lines of study. Much that seemed basic yesterday is dropped tomorrow in the unending evolution of our education. As educated men we look ahead with anticipation of a greater tomorrow but as technicians we would not have the perspective.

VOLUME 11 • APRIL 1953 • NUMBER 2 CASE REPORTS

Fracture of the mandible of a child: *report of case*

■ *James L. Bradley, D.D.S., M.S.D., M.Sc. (Dent.), St. Albans, L. I., N. Y.*

Fractures of the mandible in children are relatively rare. Methods of treatment used effectively in adults are applicable in most cases of fractures in children.

On June 5, 1949, a 2 year and 9 months old child was admitted to the U. S. Naval Hospital, St. Albans, L. I., N. Y., with the history of falling six days earlier from a second story window, landing on his chin. He did not lose consciousness. The past history was noncontributory.

Clinical examination revealed a fracture of the mandible between the central incisors and the right deciduous first molar. The molar was displaced inwardly and was attached by soft tissue. There was lateral and downward displacement of the segment with pronounced mobility on manipulation. There was a wound at the inferior border of the symphysis of the mandible which had been closed with one silk suture.

Roentgenographic examination of the facial bone revealed an oblique fracture through the incisor area of the mandible. There was a radiopaque mass which appeared as a bone chip in the soft tissues of the mental region (Fig. 1, left). The general position and alignment of the mandibular fracture was an outward and downward displacement (Fig. 1, right). The right maxillary first molar was rotated laterally. There was no evidence of a maxillary fracture and no other abnormality could be demonstrated.

The physical examination was negative except for oral trauma. A laceration on the undersurface of the chin had been approximated with one silk suture. There was tenderness and slight edema over the inferior border of the mandible in the symphysis region. The patient could open his mouth about 6 to 8 mm. which caused him pain.

Blood and urine laboratory examinations were normal.

On June 5, 1949, the patient was started on a course of treatment consisting of 250,000 units of penicillin given intramuscularly, daily.

On June 6, anesthesia was induced with open vinyl ether and maintained with nitrous oxide, oxygen and ether insufflation via a nasopharyngeal catheter. Impressions were made of the maxillary and mandibular arches, and an acrylic splint was constructed to fit over the deciduous teeth (Fig. 2).

On June 8, under general anesthesia, the fracture was reduced and the acrylic splint was placed in position. Two circumferential wires

The opinions or assertions contained in this article are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

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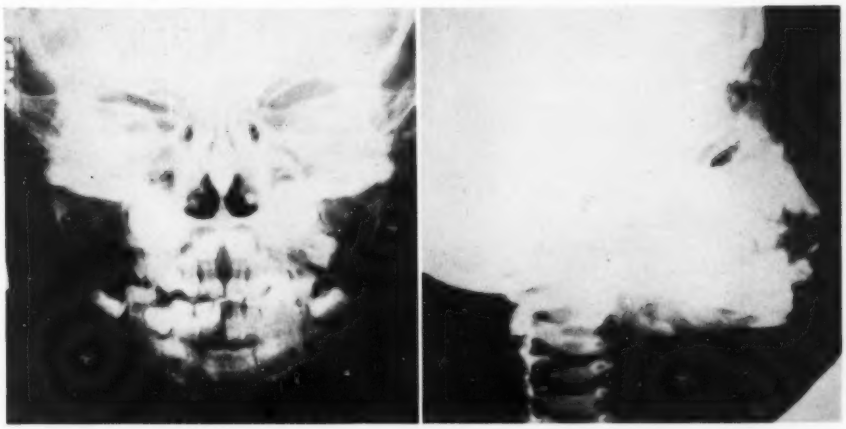


Fig. 1.—Left: Fractured mandible in the symphysis region. Right: Displaced segment

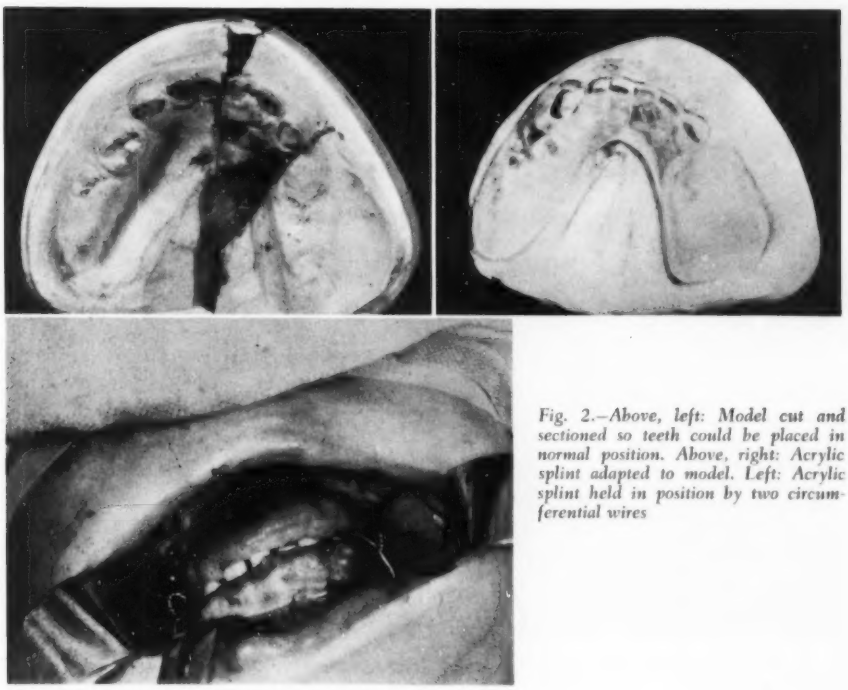


Fig. 2.—Above, left: Model cut and sectioned so teeth could be placed in normal position. Above, right: Acrylic splint adapted to model. Left: Acrylic splint held in position by two circumferential wires

were placed around the body of the mandible in the mental regions and secured, immobilizing the segments (Fig. 3). Débridement was done on the lacerated wound of the chin. One piece of cinder measuring 0.5 by 0.5 cm. was removed. The wound was closed with two interrupted sutures of #000 dermalon.

Postoperative roentgenograms showed that the fracture was reduced and immobilized in excellent position and alignment (Fig. 4, above). There was no evidence of the previously described radiopaque mass in the soft tissue.

The patient was continued on penicillin therapy. He was given a high caloric, high protein, liquid diet. On the first postoperative day his temperature rose to 101.2° F., but subsided to normal in two days. He took fluids fairly well, seemed comfortable and slept at frequent intervals.

On the fifth postoperative day the sutures were removed and he could masticate a soft diet. Penicillin therapy was discontinued on the eleventh postoperative day. Because of a weight loss of four pounds it was decided to discharge the patient from the hospital so that his mother could supervise his nourishment. Calcium diphosphate 7.5 grains and vitamin D were prescribed by the pediatrician to be taken twice daily. The mother was instructed in oral hygiene for the patient.

The patient returned three times a week to the hospital for observation. On the thirty-second postoperative day he was readmitted for the removal of the splint under general anesthesia. The patient was discharged on July 16, 1949 and the parents were advised to return him for observation to the outpatient department.

On July 15 the roentgenologist reported that the fracture fragments were in satisfactory alignment and position. Healing was progressing as the fractured lines were less distinct (Fig. 4, above).

The teeth were in good occlusion and the patient had a good functioning mandible (Fig. 4, below). The parents were advised to consult an orthodontist regarding the future eruption of the permanent dentition.

COMMENT—By giving a general anesthetic, impressions could be taken of the child's jaws and satisfactory models constructed. The model of the mandible was divided at the site of the lines of fracture and reassembled in proper occlusion with the model of the opposing jaw. This reassembled cast was used in the construction of a splint of clear acrylic resin. By

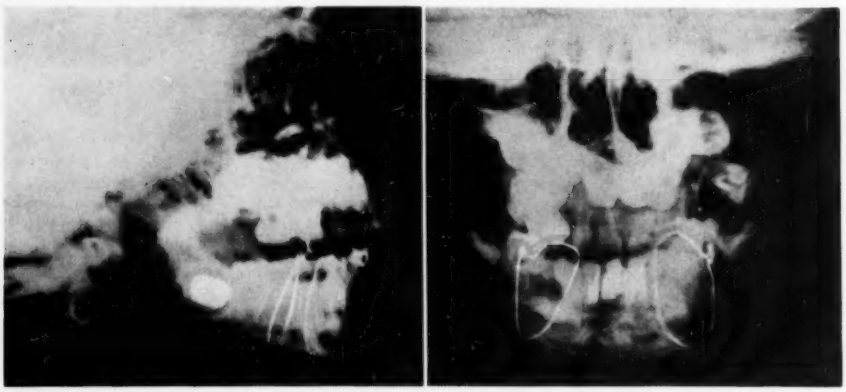


Fig. 3.—Left: Circumferential wires in position. Right: Lateral view

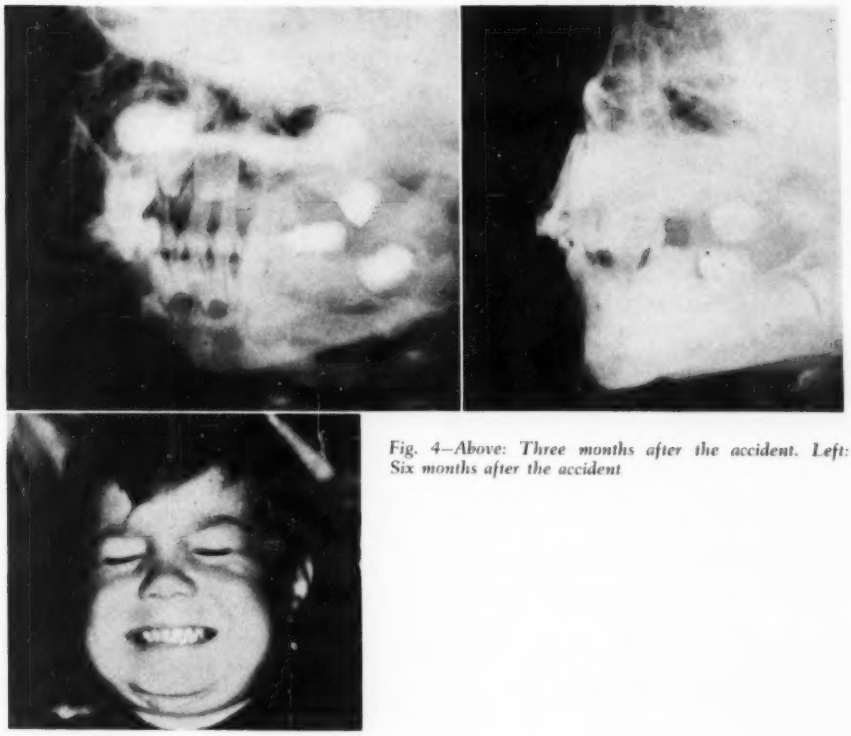


Fig. 4—Above: Three months after the accident. Left: Six months after the accident

the use of circumferential wires the fracture was reduced and immobilized without discomfort to the patient. The patient had a good functional result.

SUMMARY—Circumferential wiring as used effectively in adults was applicable to the immobilization of a fractured mandible of a 2½ year old child.

■ Seizure of Thought

I have observed with wonder so many intellectual and literary fashions that I have come at last to rely positively upon one conviction alone. No idea is so antiquated that it was not once modern. No idea is so modern that it will not some day be antiquated. . . . To seize the flying thought before it escapes us is our only touch with reality.—*Ellen Glasgow, Address to the Modern Language Association.*

Compound comminuted fracture of the maxilla and mandible with right and left subcondylar fractures: *report of case*

■ *Walter W. Crowe, D.D.S., Bremerton, Wash.*

Multiple injuries of the facial bones resulting from airplane crashes or injuries of modern warfare often present a complex problem. Facial injuries involving the maxilla and mandible require a systematic plan of treatment in the reestablishment of normal occlusion of the teeth, normal functioning of the jaws and restoration of a normal facial contour. Since the fragments of both jaws may be displaced and movable without a fixed point, the maxilla and mandible must be adequately supported during the period of healing.

Complicated injuries often require several operations, and it is of the utmost importance that an orderly plan of therapy be outlined preoperatively. The following case is of interest because it presented several problems in the reestablishment of the original plane of occlusion, with restoration of a normal facial contour and normal condylar function.

REPORT OF CASE—An aviator, aged 24, was admitted to the hospital the evening of June 16, 1949, approximately one hour after he had been in an airplane crash. He was suffering from multiple facial fractures and lacerations, with bleeding from the nose and mouth. His face apparently had struck the instrument panel when the airplane fell from an altitude of approximately 100 feet. The motor had failed on the take-off.

Physical examination revealed a well-developed, well-nourished white man, with several lacerations and penetrating wounds of the soft tissues on and below the chin and about the face and lips, some of which extended through the soft tissues into the mouth. There was considerable edema and hemorrhage present. The face was considerably swollen, with periorbital ecchymosis and subconjunctival hemorrhage.

Oral examination revealed severe laceration of the mandibular mucosa, which exposed the bone and alveolar process of the mandible. The crowns of several of the maxillary teeth were fractured, and the right maxillary tuberosity with the two upper molar teeth was completely detached from the maxilla except for the soft tissue attachment of the buccal mucosa. The entire maxilla had mobility.

The lower right cuspid was displaced into the floor of the mouth. The lower right lateral incisor had been evulsed. The large segment of mandibular bone and alveolar process that supported the remaining three lower anterior teeth was held by soft tissue attachment only and also was displaced into the floor of the mouth. The left body and symphysis of the mandible revealed multiple fractures, with severe displacement of the fragments. There also were bilateral subcondylar fractures, with severe displacement.

Examination revealed no skull, scalp or intracranial injury. The blood pressure varied from 110/60 to 130/70. Routine laboratory examinations disclosed no abnormalities. The results of the remainder of the physical examination were normal except for fractures of the right and left tibia.

Roentgenograms confirmed the clinical findings of multiple facial fractures (Fig. 1,

The opinions or assertions contained herein are the private ones of the writer and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

Captain, DC, U.S. Naval Hospital, Bremerton, Wash.

left). The left lateral projection of the mandible revealed a comminuted type of fracture with downward displacement of the fragments (Fig. 1, below). Skull roentgenograms were normal.

PREOPERATIVE TREATMENT—The patient was given 1,000 cc. of whole blood on admission. He was also given a tetanus toxoid booster injection. Penicillin, 50,000 units, was given intramuscularly every three hours.

FIRST OPERATION—Under local anesthesia the blood clots and foreign materials were removed from the lacerations and penetrating wounds about the face and lips. The skin was thoroughly cleansed with soap and water, and nonviable tissue was removed. The wound edges were closed with interrupted dermalon suture. Rubber drains were placed where indicated. To decrease the possibility of a hematoma, a pressure dressing was placed and left 48 hours. No attempt was made to reduce the fractures of the facial bones.

Postoperatively the patient was placed on a controlled intake which consisted of a high vitamin, high caloric, liquid diet. The mouth was kept as clean as possible. The wounds were treated with aqueous thimerosal (Merthiolate), and dressings were changed as indicated.

SECOND OPERATION—On June 18, after premedication, the fractured maxillary teeth and roots were removed under local anesthesia. The right maxillary tuberosity and the two attached upper molar teeth were placed in anatomic position and sutured to the soft tissues of the palatal mucosa. The lower right cuspid was removed with the use of local anesthesia. An arch bar was wired to the mandibular bicuspids, molars and lower left cuspid. The remaining three lower anterior teeth were pressed forward and wired to the mandibular arch bar (Fig. 2, left).

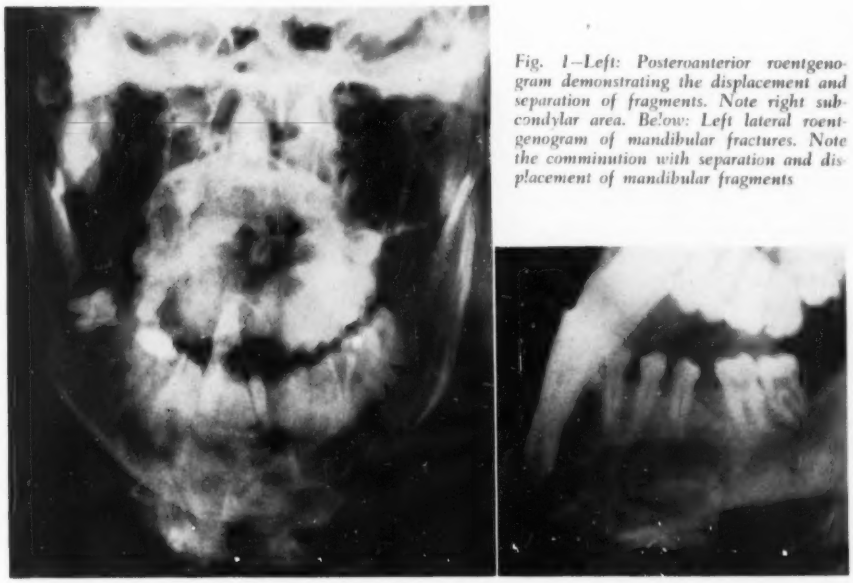
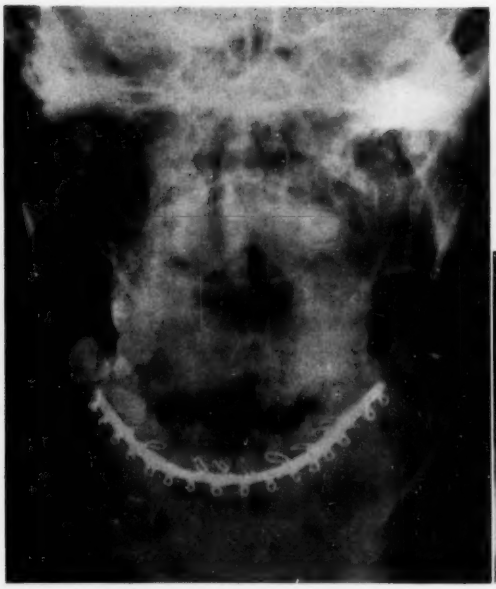


Fig. 1—Left: Posteroanterior roentgenogram demonstrating the displacement and separation of fragments. Note right subcondylar area. Below: Left lateral roentgenogram of mandibular fractures. Note the comminution with separation and displacement of mandibular fragments



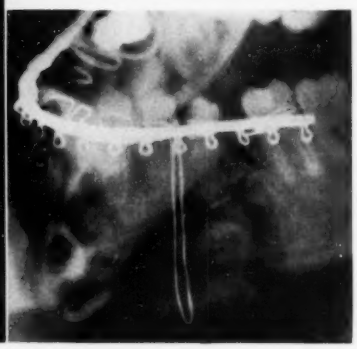


Fig. 2–Left: Roentgenographic view after the removal of the maxillary fractured teeth and the suturing in place of the right maxillary tuberosity. The mandibular arch bar has given considerable stability to the multiple mandibular fractures. Below: Left lateral view after circumferential wire was passed around the mandible

COMMENT—Surgical removal of the right maxillary tuberosity, even though it was practically detached from the maxilla, would have exposed the floor of the maxillary sinus and eliminated the guide to the reestablishment of satisfactory occlusion and replacement of displaced fragments. After the second operative procedure the mandibular fractures appeared stabile, and the patient seemed much more comfortable.

THIRD OPERATION—On June 23, with premedication and local anesthesia, a double strand of 26 gauge stainless steel wire was passed around the mandible and placed over the mandibular arch bar between the lower left bicuspid teeth. The ends of this double strand of wire were twisted tightly over the fracture bar (Fig. 2, below). Continuous loop wiring was placed on the left maxillary cuspid, bicuspid and molar teeth.

Despite continuous penicillin therapy, swelling on the left side of the face developed, with drainage from the external incision made on June 23. Osteomyelitis of the mandible was suspected. All drainage subsided in seven days, and there was no roentgenographic evidence of sequestration. The circumferential wire elevated the large segment of displaced mandibular bone, and adjustments were made until a satisfactory reduction had been attained. Penicillin therapy was discontinued July 8.

On June 25, 1949, a plaster head cast was placed on the patient, into which was incorporated a metal band of aluminum about 1 inch wide, to which had been riveted three metal posts. Each post possessed a perforation and thumb screw set for the reception of a rod attachment. A strip of felt about one quarter inch thick was taped to the patient's forehead before the cast was constructed, in order to prevent pressure ulceration. This strip of felt was later removed, leaving a space between the cast and the patient's forehead.

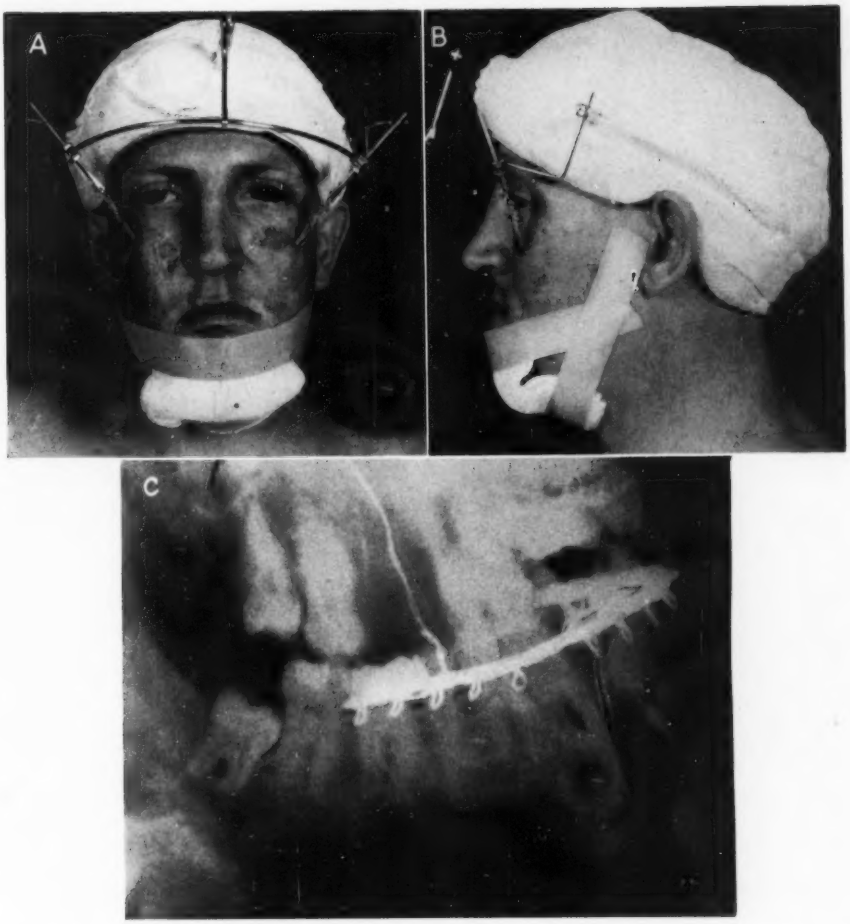


Fig. 3—A: Appearance of the patient following application of plaster head cast with metal head band. Note felt pad across the forehead. Traction wires have been passed through the cheeks. B: Profile view of left side of patient's head. Adjustable hooks on rod attachment engage traction wires in any given plane as they emerge from the cheeks. This prevents lateral pressure on soft tissues, which could otherwise produce linear scarring of the cheeks. C: Right lateral roentgenogram demonstrating attachment of traction wires to the mandibular arch bar. Occlusion has been reestablished in the maxillary-mandibular molar region

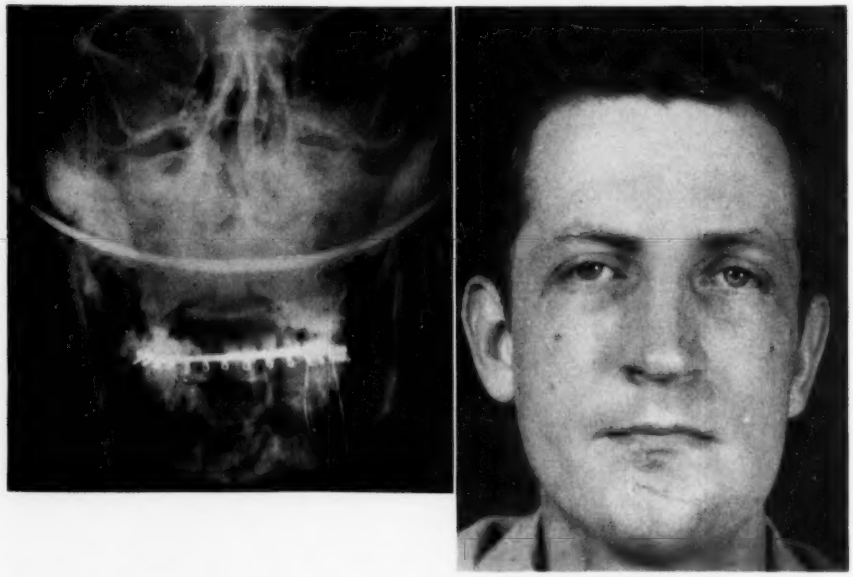


Fig. 4—Left: Posteroanterior roentgenogram following reduction and immobilization of multiple fractures of the maxilla and mandible. Note condylar alignment. Right: Appearance of the patient after removal of plaster head cast with head band and attachments

FOURTH OPERATION—On June 27, with premedication and local anesthesia, traction wires were passed through the cheeks. This was done by means of a long straight cutting needle, to which was attached a double strand of 26 gauge stainless steel wire (Fig. 3, A). The needle was carried through the soft tissues of the cheek into the buccal sulcus opposite the interspace between the second bicuspid and the first molar tooth. The double strand of wire was attached to the mandibular arch bar in the bicuspid region (Fig. 3, C). Rubber bands were placed between the traction wires and the adjustable hooks to provide the upward pull needed to elevate the mandibular arch into normal occlusion (Fig. 3, B).

The following day, intermaxillary elastics were placed between the continuous loop eyelets of the left maxillary cuspid, bicuspid and molar teeth, and the lower left mandibular arch bar. This gradual, continuous combined pull slowly elevated and guided the mandible into its correct position. All remaining maxillary and mandibular teeth were now in occlusion.

A posteroanterior roentgenogram was taken June 30 (Fig. 4, left). Roentgenographically the multiple fractures appeared to be satisfactorily reduced. The remaining teeth were in occlusion, and the inferior border of the mandible appeared smooth and continuous. The position of the rami and the fractures in the subcondylar areas appeared to be properly aligned.

The circumferential wires were removed from about the mandible after 27 days, on July 20. On July 30, the traction wires and the head cast with head band and rod attachments were removed (Fig. 4, right). The right maxillary tuberosity and the alveolar process that supports the right upper molar teeth were

well attached to the maxilla (Fig. 3, C). The three lower anterior teeth were not in a condition satisfactory to warrant their retention, and their removal was planned. The large segment of bone and alveolar process supporting these teeth, however, was well attached to the mandible.

Clinically complete bony union in the symphysis region of the mandible had not been attained. A mandibular acrylic resin splint was constructed and tried in the mouth to be sure that it was satisfactory before the arch bar and the three lower anterior teeth were removed (Fig. 5, A).

FIFTH OPERATION—On August 5, the continuous loop wiring was removed from the maxillary teeth, and similarly, the arch bar was removed from the remaining mandibular teeth. Under local anesthesia, the three remaining lower anterior teeth were removed and the tissues approximated and sutured.

Holes were drilled in each interdental area of the acrylic resin splint, and it was secured by means of stainless steel wire to the remaining mandibular teeth (Fig. 5, B). This gave adequate stabilization for the partly healed fracture in the symphysis area.

COURSE—The patient was now capable of masticating semisolid food to a certain extent and could open his mouth freely (Fig. 5, B). His improvement thereafter was remarkable. On August 15, a left lateral roentgenogram was taken as a final check on the reduction and position of all mandibular fractures (Fig. 5, C).

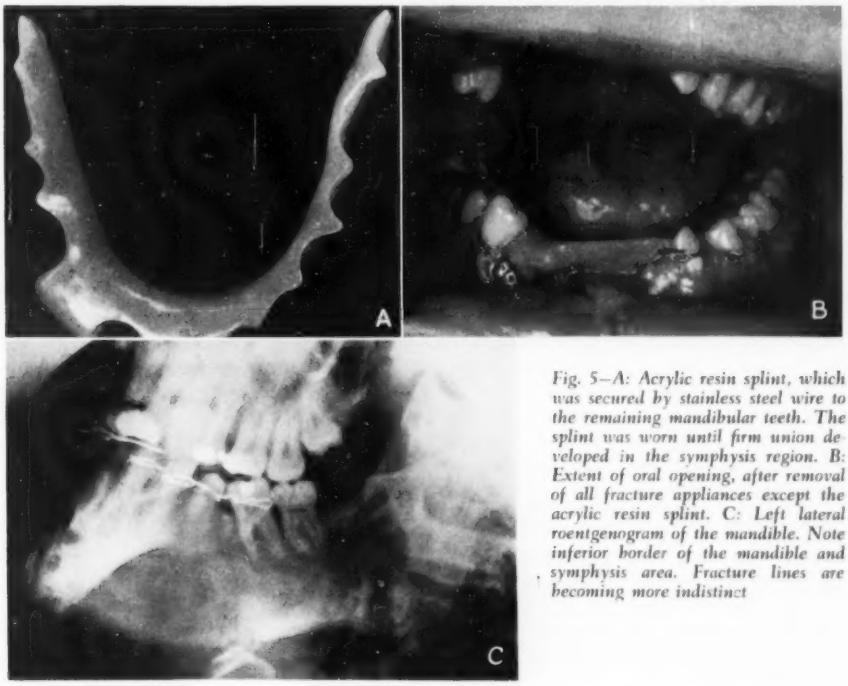


Fig. 5—A: Acrylic resin splint, which was secured by stainless steel wire to the remaining mandibular teeth. The splint was worn until firm union developed in the symphysis region. B: Extent of oral opening, after removal of all fracture appliances except the acrylic resin splint. C: Left lateral roentgenogram of the mandible. Note inferior border of the mandible and symphysis area. Fracture lines are becoming more indistinct

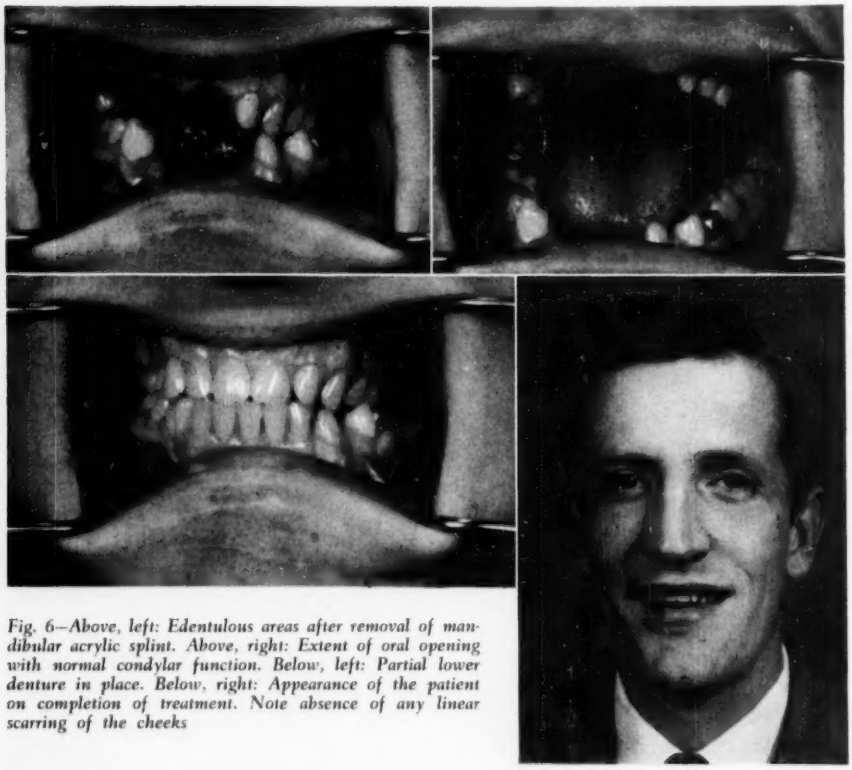


Fig. 6—Above, left: Edentulous areas after removal of mandibular acrylic splint. Above, right: Extent of oral opening with normal condylar function. Below, left: Partial lower denture in place. Below, right: Appearance of the patient on completion of treatment. Note absence of any linear scarring of the cheeks

All fragments appeared to be in a satisfactory position. The patient returned for weekly examination and adjustments. On October 5, the mandibular acrylic resin splint was removed. Clinically the symphysis region appeared to have good bony union (Fig. 6, above).

A partial lower denture was inserted October 10 (Fig. 6, below, left). The patient was last seen April 6, 1950 (Fig. 6, below, right). Normal sensation had returned to the lower lip. The condylar movements appeared to be normal in every way, and the occlusion and facial contour of the patient had been satisfactorily reestablished.

COMMENT—Few deformities are of more concern to the patient than those caused by facial injuries that have resulted in a poor functional or cosmetic result. Complicated fractures of the facial bones often require considerable treatment planning, and reduction and immobilization should not be attempted until satisfactory roentgenograms have been obtained.

Immediate, thorough and painstaking surgical closure of all facial wounds is advantageous. Prompt closure of these wounds with application of sterile compressive dressings decrease the incidence of hemorrhage and stimulates healing. Every fragment of bone in a

comminuted fracture is a potential center for the formation of osteoid tissue, and, provided the blood supply is adequate, such islands of bone can be of the greatest assistance in the repair of a fracture. Acrylic resin splints are useful when, owing to loss of teeth or bone, it becomes necessary to preserve the dental arch. Such appliances give adequate stabilization in partly healed mandibular fractures. The patient is now back in aviation, has a good mental attitude and is enjoying excellent health. The results attained in this case are attributed to proper nursing, hospital care and preoperative planning.

Delayed tetanus simulating ankylosis of arthritic origin in the temporomandibular joint: *report of case*

■ *Harold G. Jacobs, D.M.D., Boston*

Tetanus resulting from the inoculation of *Clostridium tetani* usually manifests itself in the acute cases in about eight days and in the chronic cases in about four to five weeks. Idiopathic or delayed tetanus is a condition wherein the manifestation of muscular contractions is aborted for a considerable period of time owing to the increased resistance of the host to the bacteria.[1]

Osteoarthritis manifests itself in the form of new bone growths as spurs or osteophytes about the margins of joints. In the temporomandibular joint the growths of these spurs can give rise to progressive ankylosis. Associated with this type of arthritis is an affection of the terminal interphalangeal joints of the fingers. A lipping or overgrowth of bone about the margin of the finger joint causes a knob-like enlargement called Heberden's node.[2]

The treatment of tetanus with symptoms present is the immediate use of tetanus antitoxin, penicillin and paraldehyde, the maintenance of a fluid balance, an adequate diet and surgical removal of the area of infection.[3]

Tetanus antitoxin is administered by four routes: (1) intravenously, 50,000 units; (2) intramuscularly, 50,000 units; (3) intrathecally, 20,000 units, and (4) locally into the area of injury, 20,000 units.

Procaine penicillin G, for aqueous injection, 300,000 units, is administered twice a day.

Paraldehyde, 4½ drams in oil, is given rectally in conjunction with barbiturates to control spasm.

A fluid balance is maintained by the administration of 5 per cent glucose in isotonic

1. Fairbrother, R. W. Textbook of bacteriology, ed. 2. St. Louis, C. V. Mosby Co., 1939, p. 324.

2. Foot, C. N. Pathology in surgery. Philadelphia, J. B. Lippincott Co., 1945, p. 90.

3. Weinstein, L., and Wesselhoeft, C. Penicillin in the treatment of tetanus. New England J. Med. 233:681 (Dec. 6) 1945.

sodium chloride solution. A high vitamin diet is recommended to maintain a good nutritive state.

Following is a report of a case of idiopathic tetanus that failed to produce symptoms for a period of almost five months.

REPORT OF CASE—A 54 year old white, male, bricklayer was admitted to the hospital because of a "sore foot, stiff neck and a stiff jaw." On September 4, 1948, while at work, the patient stepped on a loose cement block, fell 28 feet and became unconscious. He was rushed to a local hospital, where the diagnosis was compound fracture of the right heel and ankle, two broken right ribs and lacerations of the right side of the scalp, requiring seven sutures. The right foot and heel were put into a cast and the chest strapped with a binder. On the same date the patient received 1,500 units of tetanus antitoxin. Six days later the right foot became infected, and the cast was removed. Treatment consisted of the administration of penicillin, sulfadiazine and constant irrigations. At this time a high femoral vein bilateral ligation was performed. Two weeks later the foot was incised and drained. This was repeated three more times, the last time on December 17, 1948. On December 22 the patient was discharged from the hospital. Two weeks later, on January 2, 1949, he was admitted to another hospital because of increasing "stiffness in neck and jaw."

The patient presented, on admission, severe dyspnea and acute distress. The jaws were edentulous and could be opened the width of one finger. The neck was stiff, and the patient found it difficult to move.

Examination of the blood disclosed 94 per cent hemoglobin, 4,500,000 red blood cells and 8,800 white blood cells. The blood chemistry was normal, calcium being 11.4 and phosphorus 3.0.

The temperature was 98.6°F., pulse rate 88 and respirations 20. The blood pressure was 150 systolic and 90 diastolic. The specific gravity of the urine was 1.020. The Hinton reaction of the blood for syphilis was negative.

Roentgenographic studies of the temporomandibular joint seemed to indicate that an osteophyte was present in the fossa. Clinically, there was definite evidence of Heberden's nodes at the terminal interphalangeal joints of the fingers.

On January 12 the patient had a convulsion, with clamped jaws and opisthotonus. At this time a diagnosis of tetanus was made. Immediately 80,000 units of tetanus antitoxin was given intravenously, and 1,000,000 units of penicillin was given intramuscularly. Four and a half drams of paraldehyde in oil was given by rectum to control spasm. The temperature rose to 100°F. The patient was now moribund.

On January 13 the patient received 10,000 units of tetanus antitoxin three times a day; 300,000 units procaine penicillin G, for aqueous injection, intramuscularly twice a day, and 2,000 cc. of 5 per cent glucose in isotonic sodium chloride solution intravenously.

On January 14 he was given 60,000 units of tetanus antitoxin intravenously and 40,000 units of tetanus antitoxin intrathecally. Penicillin, 100,000 units, was administered intramuscularly every three hours, with 300,000 units procaine penicillin G, for aqueous injection, three times a day. Intravenous administration of fluid was continued with 2,000 cc. of 5 per cent glucose in isotonic sodium chloride solution. His temperature rose to 103°F.

On January 15, 200,000 units of tetanus antitoxin was administered intramuscularly three times a day and 20,000 units injected into the sinus tract of the right foot.

On January 16, 40,000 units of tetanus antitoxin was administered intravenously in conjunction with 2,000 cc. of 5 per cent glucose in isotonic sodium chloride solution. Tetanus antitoxin, 20,000 units, was also administered intramuscularly. Intramuscular injection of procaine penicillin G, for aqueous injection, was continued at the rate of 300,000 units twice a day.

On January 17 and 18, tetanus antitoxin was given intramuscularly, 20,000 units three times a day, along with procaine penicillin G, for aqueous injection, 300,000 units twice a day.

On January 19, the tetanus antitoxin dose was reduced to 40,000 units, in divided doses

of 20,000, 10,000 and 10,000 units. Procaine penicillin G, for aqueous injection, was continued as before.

On January 20, there was a reduction of the antitoxin dose to 20,000 units, divided into doses of 10,000, 5,000 and 5,000 units. The procaine penicillin G, for aqueous injection, was still administered intramuscularly, 300,000 units twice a day.

On January 21, tetanus antitoxin was administered intramuscularly, 5,000 units three times a day. Intramuscular use of the procaine penicillin G, 300,000 units twice a day, was continued.

From January 22 through January 26, the dosage of antitoxin was increased to 20,000 units five times a day. Procaine penicillin G, for aqueous injection, 300,000 units twice a day, was administered intramuscularly. The wound in the right foot was saturated locally with 50,000 units of penicillin and 10,000 units of bacitracin. With this new treatment the spasms in the neck and jaw were considerably reduced.

On January 27 and 28, the dosage of tetanus antitoxin was reduced to 10,000 units three times a day. The dosage of 300,000 units of procaine penicillin G twice a day was continued.

From January 29 through February 1, the tetanus antitoxin was again reduced to 10,000 units once a day and the procaine penicillin G, for aqueous injection, was reduced to 300,000 units once a day.

From February 2 through February 14, tetanus antitoxin was administered intramuscularly in the dosage of 5,000 units three times a day. Intramuscular procaine penicillin G therapy was continued, 300,000 units once a day. On February 9 a culture of the right foot was taken.

From February 15 through 17, the tetanus antitoxin dosage was reduced to 2,500 units two times a day. The procaine penicillin G, for aqueous injection, 300,000 units once a day, was injected intramuscularly.

On February 18 the culture taken on February 9 was reported as still positive. Tetanus antitoxin therapy was omitted, and in its place 1 cc. of tetanus toxoid was injected intramuscularly. The administration of procaine penicillin G, 150,000 units twice a day, was continued.

On February 21 the patient was returned to the operating room for a reopening and cleansing of the wound in the right leg. Wet peroxide dressings were applied, and this procedure was continued to March 12.

On March 22 all penicillin therapy was stopped. A culture taken on March 18 was now reported as negative.

On March 27, 1949, the patient was discharged as cured.

COMMENT—The roentgenographic studies of the temporomandibular joint, combined with the clinical picture of Heberden's nodes on the terminal interphalangeal joints of the fingers, pointed to a diagnosis of an acute arthritic condition. The question of tetanus was considered because of the history of an accident five months previously. However, the patient at that time had been given tetanus antitoxin and penicillin. Evidently these administrations aborted the symptoms of tetanus for a period of five months.

It is rare for tetanus to be delayed for such a long period of time. Because of this prolonged delay, it was difficult to make a diagnosis of tetanus, especially when a much more obvious diagnosis presented itself with adequate roentgenographic confirmation.

CONCLUSION—All patients with a history of an accident should be considered in the light of a possible tetanus infection and be treated accordingly.—*311 Commonwealth Avenue.*

Epithelioma adenoides cysticum with follicular cysts of maxilla and mandible: *report of case*

■ *P. Philip Gross, D.D.S., Philadelphia*

In a recent article Binkley and Johnson[1] reported a case of epithelioma adenoides cysticum associated with multiple follicular cysts of the mandible, a bifid sixth rib, a broad base of the nose and a fibroma of the ovary. They were unable to find in the literature any reference to the congenital defects associated with epithelioma adenoides cysticum. Their patient was a white woman, 30 years of age, whose chief complaints were swelling of the right portion of the mandible and growths of the skin. At 16, the patient had consulted a dentist because of a persistent swelling on the right side of the mandible. Roentgenographic examination revealed multiple dental follicular cysts on both sides of the mandible. An attempt was made to control the enlargement of the cysts by irradiation therapy from 1934 to 1941. The expansive growth continued, and the patient was admitted to the hospital in 1949 for treatment of the tumor of the mandible and the cutaneous growths.

The patient was well developed but mentally dull. There were innumerable (about 1,000) slightly raised, hard papules, 1 mm. to 1 cm. in diameter, on the face, neck, anterior and posterior portion of the chest, and proximal portion of the arms. The entire right side of the mandible was enlarged. There was limitation of movement of the temporomandibular joint. The roentgenogram of the chest revealed that the anterior end of the sixth rib was bifid. The hemogram and the urinalysis revealed no abnormalities. Two months before the patient's death, sternal bone marrow examination revealed large clumps of tumor cells. As the disease progressed, there was evidence of anemia and a leukemoid reaction shortly before death. Histologic examination of the bone from the hemiresection of the right side of the mandible showed fibrosarcoma.

At autopsy there was widespread dissemination of the fibrosarcoma. The metastases, which were proved microscopically to be fibrosarcoma, were found in the long bones, skull, ribs, vertebral column and many viscera. Microscopic study of the various organs revealed no evidence of metastases from the epithelial growths.

REPORT OF CASE—A white boy, 9 years of age, was first referred in November 1950, with a history of a swelling involving the left side of the face. The swelling first was observed by his dentist during a visit for operative work. The patient was under the care of a dermatologist, who had removed a few papillary growths on his face in October 1950. The pathologic diagnosis was epithelioma adenoides cysticum.

The patient's father and mother were living and well and the patient had one brother living, age 6. There was no evidence of any skin lesions on the father, mother or brother.

EXAMINATION—The patient was well developed and mentally alert. The temperature, pulse rate, respirations, blood cell count, urine and blood pressure were within normal limits. On the patient's face, neck, chest, back and legs there were many slightly raised papules.

Associate in oral surgery, Graduate School of Medicine, University of Pennsylvania.

1. Binkley, G. W., and Johnson, H. H., Epithelioma Adenoides Cysticum: Basal Cell Nevi: Agenesis of the Corpus Callosum and Dental Cysts. *Arch. Dermat. & Syph.* 63:73 (Jan.) 1951.

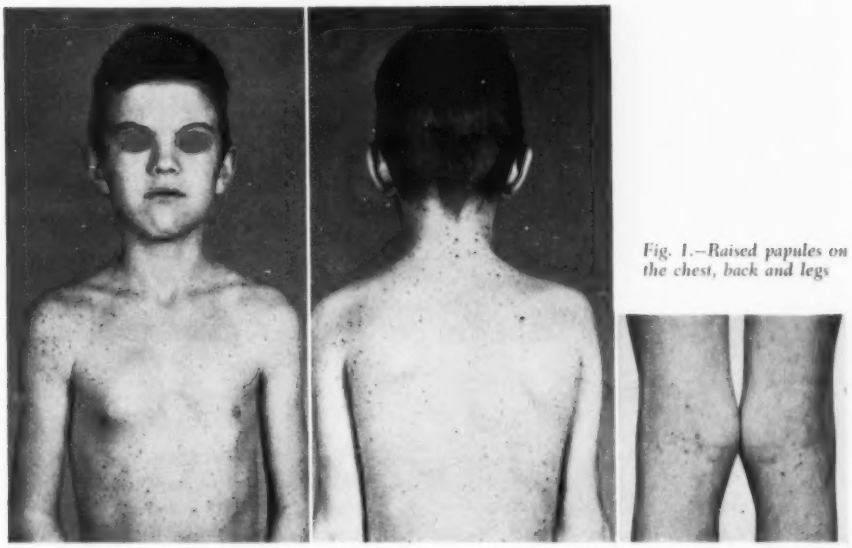


Fig. 1.—Raised papules on the chest, back and legs

There was a pronounced widening of the base of the nose (Fig. 1). The papules varied in color from that of normal skin to a pale brown.

Examination of the left side of the face revealed a swelling that involved the entire cuspid area and extended distally for about 3 cm. The swelling was firm. Palpation of the swelling along the gingival buccal gutter revealed crepitus, suggestive of a cyst. There was retarded eruption of many teeth.

ROENTGENOGRAPHIC EXAMINATION — The deciduous left maxillary second molar was in position and the permanent left maxillary second bicuspid had drifted superiorly. Above the deciduous left maxillary second molar there was a radiolucent area that extended from the left maxillary first bicuspid to the left maxillary permanent first molar (Fig. 2). On the left side of the mandible there was a radiolucent area that extended from the distal surface of the left mandibular permanent first molar distally to the area beyond the angle of the ramus. The left mandibular second molar was unerupted and located at the inferior border of the mandible. The bud of the left mandibular third molar was located at the distal surface of the radiolucent area (Fig. 3). The right side of the mandible was normal (Fig. 4). The roentgenogram of the chest revealed a synosteosis of the left first rib and bifid right and left sixth ribs (Fig. 5).

TREATMENT AND COURSE—In November 1950, under ether anesthesia, a curved incision was made which extended from the region of the left mandibular cuspid to the anterior border of the left ramus. The mucoperiosteum was dissected from the underlying osseous structure; this exposed the distal root of the left mandibular first molar and the bulging cyst wall in the mandibular second molar area. The lingual plate was found to be intact, but the buccal plate was parchment-like in character. The overlying thin osseous structure was removed. The cyst sac was enucleated by blunt dissection along with the left mandibular second molar and the bud of left mandibular third

Fig. 2.—Radiolucent area in the left maxillary region

Fig. 4.—Right side of the mandible (normal)

molar. The left mandibular first molar was removed since its roots were completely exposed. The inferior alveolar nerve could be seen intact along the inferior border of the lingual plate. The cavity was loosely dressed with iodoform gauze and the mucoperiosteum was sutured with dermalon sutures. The cyst of the left side of the maxilla was next enucleated, with the same technic as that used in the mandibular area. A section of skin, including three of the papules, was removed from the left side of the neck for pathologic examination.

PATHOLOGIC FINDINGS—The cyst wall removed from the left mandible included the crown of the second molar, the cusps of the third molar and its dental papilla, and the first molar. Representative fragments of tissue were chosen for study; all showed characteristics common to developmental dental cysts. They consisted of a thin wall of well-arranged fibrous connective tissue, with an epithelial lining. This lining was well formed, with rete pegs (Fig. 6). The diagnosis was follicular cyst of the mandible. The diagnosis based on examination

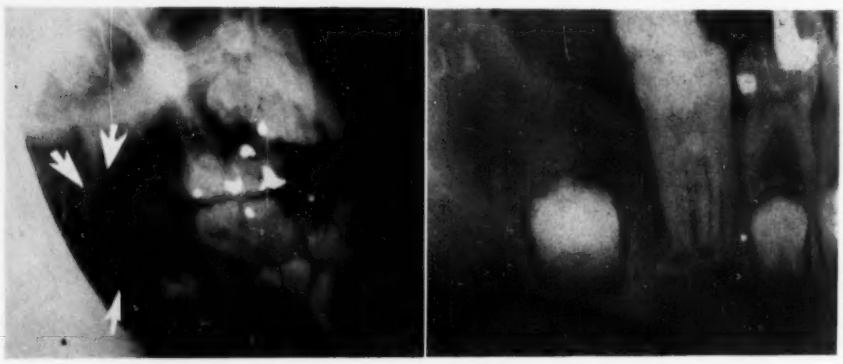


Fig. 3.—Radiolucent areas on the left side of the mandible

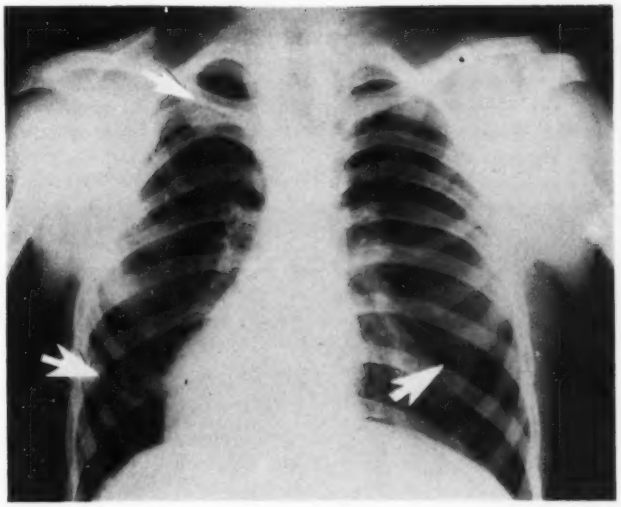


Fig. 5.—Synosteosis of the left first rib and bifid left and right sixth ribs

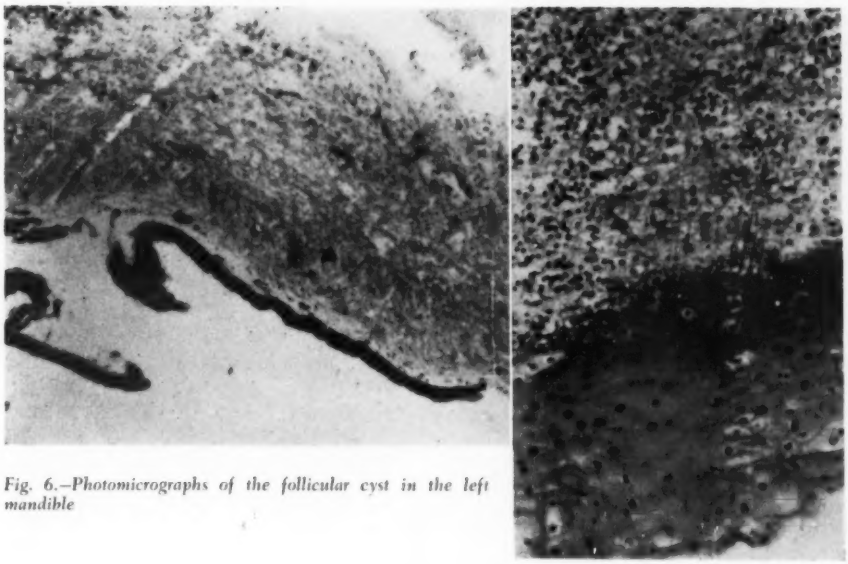


Fig. 6.—Photomicrographs of the follicular cyst in the left mandible

of the tissue from the left side of the maxilla was also follicular cyst.

Sections prepared from one of the skin lesions showed the epidermis to be arranged in folds and waves, making it rugose in many places and verrucose in several. It included a delicate stratum corneum and a thin epithelial layer consisting of an average of six cells in depth. Melanin was found in the basal layer.

From at least one point the epithelium had grown inward in the form of irregular branching proliferations which radiated from the point of origin (Fig. 7, above), sometimes intercommunicating and ending in rounded club-

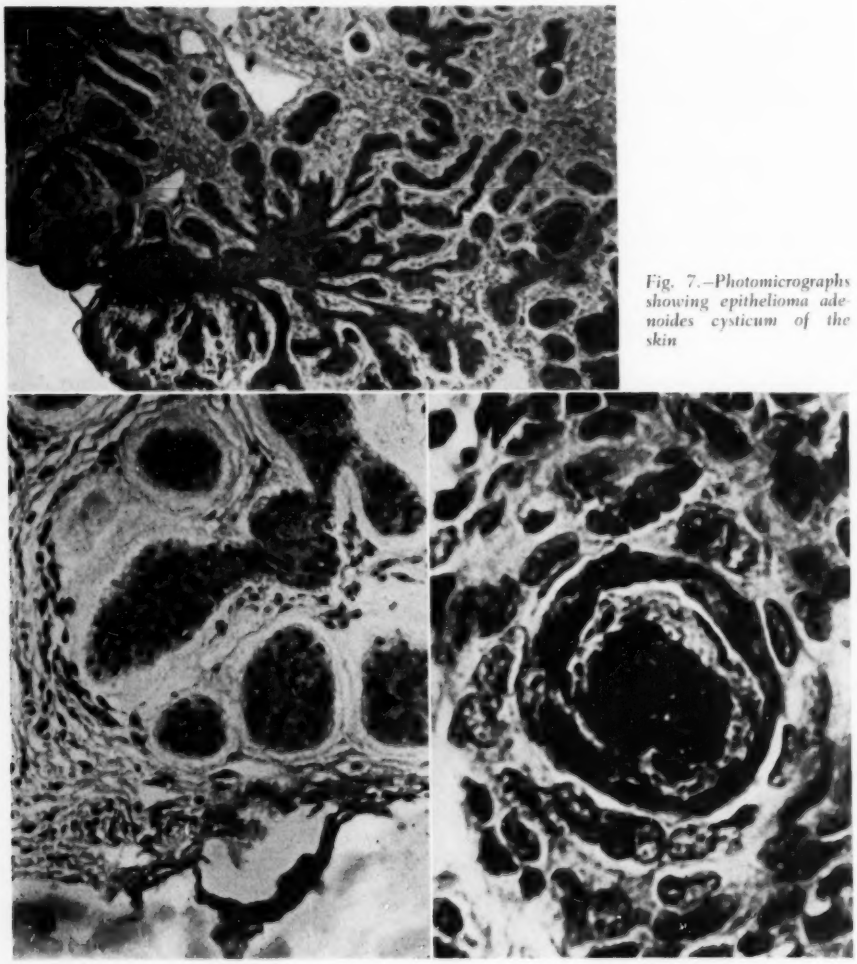


Fig. 7.—Photomicrographs showing epithelioma adenoides cysticum of the skin

shaped terminations, many of which were surrounded by an area of delicate mucoid material devoid of cells, possibly representing alteration of the basement membrane (Fig. 7, below, left). In at least half a dozen places the epithelial cells showed differentiation toward the hair shaft and follicle complex, which was abortive and represented only by brown pigment, or which enclosed an empty rounded space. The differentiation sometimes produced pink-staining material (keratin or eleidin) (Fig. 7, below, right) and sometimes formed a stratum granulosum. The differentiating cells contained more pigment than any of the other epithelial cells. The pathologic diagnosis was epithelioma adenoides cysticum.

COMMENT—The purpose of this paper was to present a case similar to that presented by Binkley and Johnson of epithelioma adenoides cysticum in a boy 9 years of age. The syndrome of the skin lesions, cysts of the mandible and maxilla, broad base of nose and bifid ribs were found in both patients. Binkley and Johnson stated that in their case there had been no biopsies of the dental lesions from age 14 to 30. It was their opinion that the dental follicular cysts of the mandible degenerated into fibrosarcoma, with widespread metastases and death. When their patient was 16 years of age, however, the cysts were treated with irradiation therapy, which is of no value in dental follicular cysts. The importance of surgical treatment of follicular cysts cannot be overemphasized.

The similarity of these cases proves the importance of cooperation between the dermatologist and the oral surgeon. Investigation for associated anomalies might be worth while, as the cutaneous skin lesions did not present the major clinical problem. The most recent examination of our patient showed no recurrence in the operative area.

Deepening of labial sulcus by mucosal flap advancement: *report of case*

■ *Henry B. Clark, Jr., M.D., D.D.S., Minneapolis*

In the technics which have been reported previously for deepening the labial or buccal sulci (Kazanjian,[1] Esser,[2] Pickerill,[3] Thoma,[4] Cooley[5] and Archer[6]), emphasis has been placed on certain principles of surgery which in each instance merit consideration. At the same time, analysis of these methods frequently reveals disregard for other fundamentals of tissue behavior that have been well established in the literature pertaining to plastic procedures in general. Four of these principles, which apply to the topic under consideration, are that:

1. Raw surfaces on soft tissue will contract steadily, healing with a dense mass of scar. Raw surfaces of soft tissue surgically covered with epithelium undergo minimal contraction.

Division of oral surgery, School of Dentistry, University of Minnesota.

1. Kazanjian, V. H. The surgical treatment of abnormalities of the edentulous alveolar processes and the palate. Am. J. Orthodont. & Oral Surg. 26:263 March 1940.

2. Esser, J. F. Studies in plastic surgery of the face. Ann. Surg. 65:297 March 1917.

3. Pickerill, H. P. Intraoral skin grafting: the establishment of the buccal sulcus. Brit. J. D. Sc. 62:135, 1919.

4. Thoma, K. H. Oral surgery, ed. 2. St. Louis, C. V. Mosby Co., 1952, p. 398-414.

5. Cooley, D. A method for deepening the mandibular and maxillary sulci to correct deficient edentulous ridges. J. Oral Surg. 10:279 Oct. 1952.

6. Archer, W. H. A manual of oral surgery. Philadelphia, W. B. Saunders Co., 1952, p. 162-166.

2. Raw areas on bony surfaces heal with acceptable soft tissue covering; contracture cannot occur because of the rigidity of the underlying base. This principle is used commonly in closing antraoral fistulas with a palatal flap, wherein the denuded donor surface heals satisfactorily. Much cleft palate surgery takes advantage of the same phenomenon.

3. Epithelial flaps to be moved to a new location must be sufficiently undermined by sharp dissection to permit retention in their new location without tension.

4. There is a strong tendency for soft tissues undergoing plastic revision to return to their former position. This tendency must be averted by overcorrection and adequate fixation with checkrein sutures originating from a fixed base.

The following case report illustrates the application of these principles:

REPORT OF CASE—A white man, aged 65, was referred to the oral surgery clinic, University of Minnesota School of Dentistry, on August 23, 1951 because of inability to wear his recently constructed lower denture. He complained that the denture moved about when he talked and was of no use in eating. His professional duties as a clergyman required that he have adequate prosthetic replacements for his missing teeth.

Past medical history revealed no findings that had a bearing on the present complaint. Physical examination disclosed a pleasant, cooperative man wearing a full upper denture with comfort, and with an edentulous lower ridge. The alveolar process was sturdy and well formed, but the labial sulcus or vestibule was completely absent. The remainder of the physical examination revealed no significant findings. Blood count, urinalysis, and bleeding and clotting time were normal. Roentgenographic survey of the mandible disclosed no abnormalities.

OPERATION—Under bilateral mandibular block and infiltration anesthesia, the following procedure was performed (Fig. 1 and 2):

1. A transverse incision was made just labial to the alveolar ridge from cuspid to cuspid areas.

2. The incision was carried downward

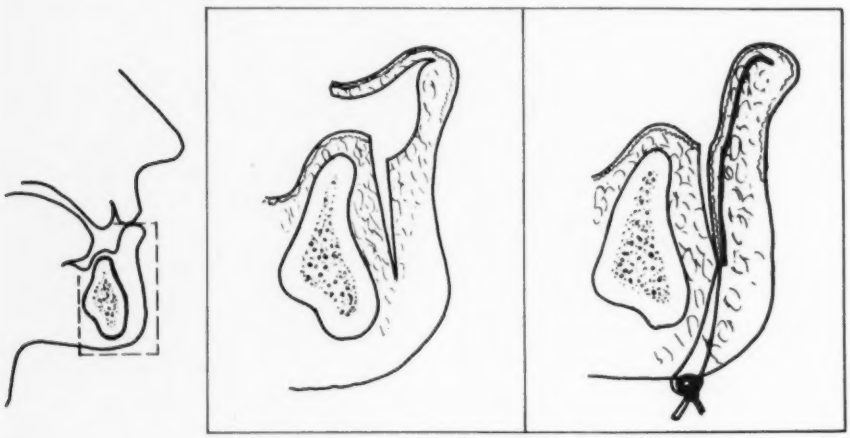


Fig. 1—Scheme of operation (sagittal section)

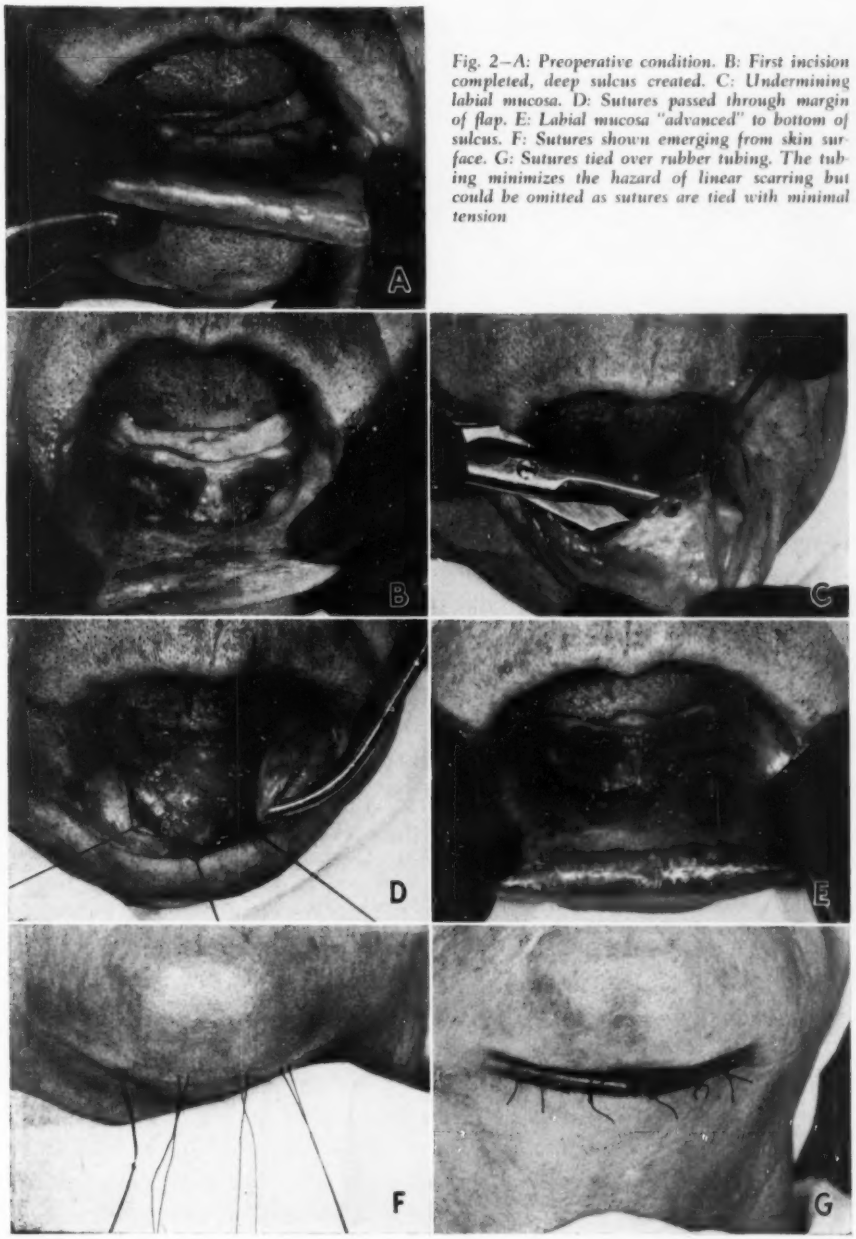


Fig. 2—A: Preoperative condition. B: First incision completed, deep sulcus created. C: Undermining labial mucosa. D: Sutures passed through margin of flap. E: Labial mucosa "advanced" to bottom of sulcus. F: Sutures shown emerging from skin surface. G: Sutures tied over rubber tubing. The tubing minimizes the hazard of linear scarring but could be omitted as sutures are tied with minimal tension

Fig. 3—Final result, intraoral and extraoral views

to a depth of 1.5 cm., leaving only periosteum and a small amount of other connective tissues on the anterior surface of the mandible (Fig. 2, B).

3. Thorough undermining of the labial mucosa was accomplished by sharp dissection, so that advancement of the flap to the lowest part of the sulcus could be achieved without any tension (Fig. 2, C).

4. Sutures were arranged at the margin of the mucosal flap, each threaded through a straight, cutting needle (Fig. 2, D).

5. The needles were passed from the depth of the newly created sulcus down and out through the skin surface (Fig. 2, F). This insured adequate fixation of the mucosal flap at the deepest level of the raw labial region.

6. The sutures were tied over rubber tubing (Fig. 2, G).

POSTOPERATIVE COURSE — Fairly severe postoperative bleeding occurred as the local anesthetic wore off. This was controlled with pressure, ice packs, and morphine sulfate 0.016 Gm. No further bleeding resulted after the first two hours. The sutures were removed on the seventh postoperative day. The resolution of all ecchymosis was complete 21 days later. Two months after the operation, the patient's dentist constructed a new lower denture which was worn successfully. His appearance one month after surgery is shown in Figure 3. The depth of the sulcus was approximately 1.0 cm.

The principle described in this report has been used by us in several instances where lower dentures were needed, and in one instance where an upper denture was needed. Satisfactory results were obtained for all patients treated in this manner.

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Continuing education in oral surgery

THE EDUCATION COMMITTEE of the American Society of Oral Surgeons, in its report at New Orleans, advocated changing the program of the annual meeting of the Society. The Committee suggests that the meeting be expanded to provide a divided program, one half of each day being devoted to scientific lectures featuring reports of new experimental work, and the other half to classes in special phases of oral surgery or its allied basic sciences. Members would enroll in classes of their choice, most of which would be organized and taught by members of the Society.

To stand still in the current era of rapid advance, is, in effect, to regress. It therefore behooves everyone engaged in the practice of the healing arts to make a continuous effort to improve his knowledge as well as his particular technical skill. Much has been said about the value of personal experience, but to the student the benefits of personal experience can be augmented by the guidance provided by the experience of others. It is to gain such benefit that most professional meetings have been instituted. To expand the annual meeting of the American Society of Oral Surgeons one step further and add courses in particular subjects would seem to be a move in the proper direction.

The type of program advocated by the Committee on Education has been employed with great success by other societies for several years. These programs have been successful primarily because of a continued demand by the membership and because some members have been willing to undertake the presentation of an outstanding course each year.

Changing to a divided type of program would cause the essay portion naturally to be more concentrated and devoted specifically to new developments in a rapidly changing field. The addition of the Chalmers J. Lyons Memorial Lecture, the first of which appears elsewhere in this issue, will, by its very nature, guarantee an outstanding essay for each program. It has been suggested that the president also be responsible for a scientific paper at each meeting. Other outstanding papers doubtless will be available. It is to be hoped that the society will see fit to follow the recommendations of their committee and change to the type of program recommended.—*Fred A. Henny.*

■ Ameloblastoma in the Mandible

Q.—A patient who had an ameloblastoma removed from the mandible four years ago now shows a radiolucent region, 3 mm. in diameter. The lesion is located in and confined to the central portion of the mandible in the region of the second molar. This suggests a recurrence of the tumor. Is radical treatment now indicated?

A.—The great tendency of these tumors to persist is apparently demonstrated by this case. In view of the location and size of the lesion, it would appear amenable to local excision. The material should be carefully examined by the pathologist since these tumors may change to a more malignant neoplasm on recurrence.

■ Prolonged Bleeding or Clotting Time

Q.—What is the significance of a laboratory report of prolonged bleeding or clotting time?

A.—Bleeding and clotting times are only crude determinations and must be correctly interpreted. Disturbances in vascular integrity and deficient thrombocytes may result in prolonged bleeding time with a normal clotting time. Hemophiliacs, on the other hand, usually will have normal bleeding times with prolonged coagulation time. Normal findings do not rule out a bleeding tendency since certain hematological dysfunctions such as hemophilia have periods of temporary remission. More detailed blood studies such as platelet counts, clot retraction, prothrombin time and prothrombin consumption, as well as complete and differential blood cell counts will be helpful. Bleeding and clotting time studies should be made routinely when patients give a history of prolonged bleeding after extractions.

■ Calculus Obstructing Submaxillary Duct

Q.—How do you manage the patient who has calculus obstructing the submaxillary duct in the floor of the mouth and an associated cellulitis with an acute secondary infection in the region?

A.—There is a strong tendency to remove the stone immediately in such an instance. Surgical intervention, however, in the face of extensive inflammatory reaction and infection will handicap the procedure and complicate the healing. It is well to delay removal of the stone and to rely on antibiotic supportive care and hydrotherapy for a short period until the acute reaction has subsided. The delay of a day or two will allow a more satisfactory removal and there will be less possibility of obstruction by scar tissue.

■ Yellow Spots on the Buccal Mucosa

Q.—What is the explanation for the presence of the yellow spots on the buccal mucosa designated as Fordyce's disease?

A.—This clinical picture is produced by ectopic sebaceous glands normally found as accessory skin structures. The inclusion of these structures at the lines of fusion of fascial processes where the superficial location of the fasciae and thin mucosal covering make them visible.

This section, devoted to queries and comments from readers on topics of current interest to oral surgeons and general dental practitioners, is edited by James R. Hayward, University Hospital, Ann Arbor, to whom readers are invited to send their communications. The answers, prepared by competent consultants, do not necessarily represent the opinions of any official scientific organization. Your participation in this section is invited.

The Editor

■ INTRAVENOUS ANESTHESIA IN DENTISTRY. By S. L. Drummond-Jackson. 140 pages. Bibliography and index. Price $5. London and New York, Staples Press, 1952.

The author presents a strong case in support of intravenous anesthesia for all forms of dentistry. His experiences cover the administration of 20,000 anesthetics during which 100,000 cavities were prepared and a large number of teeth were extracted. The various chapters include discussions of mode of action, advantages and disadvantages of intravenous anesthesia, equipment and facilities required, a description of technic and a final chapter listing of opinions of other workers in the field of anesthesia in dentistry.

The author has utilized much space in advocating with great enthusiasm the advantages of intravenous anesthesia over nitrous oxide or local anesthesia. In many places, one gains the impression that the text is more of an editorial than a book.

In contrast to the present trend in the United States, the author employs a single, rapidly administered intravenous injection and then completes his work while the drug is effective. This, of course, calls for considerable speed, and the author describes a very efficient method of nurse assistance at the chair. This consists primarily of employing interchangeable straight and contra angle handpieces with various burs and stones already in place.

A typical dental appointment is described in which six cavities are prepared and lined under anesthesia during a 30 minute period. This is followed by a similar length of time for recovery. Following recovery, the patient is replaced in the dental chair and the fillings are inserted. Carbide burs and air spray are liberally employed throughout.

Recognition and treatment of possible complications are covered by the author although he feels that they are very infrequent when the drug is administered with care and skill. Mouth to mouth breathing is described as a means of resuscitation when respiration ceases. In the opinion of the reviewer, it would be wiser to employ adequate resuscitation equipment.

The author has brought forth an interesting technic, one which will undoubtedly increase in favor and usage over a period of years. However, adequate educational and training facilities must obviously be developed if such a movement is to proceed with recognition and safety. It is obviously the intent of the author to present one side of a controversial subject in an attempt to stimulate interest in his chosen subject. In this he has been successful.—*Fred A. Henny.*

■ ORAL SURGERY. By Kurt H. Thoma. Second edition. 1,688 pages with 1,789 illustrations, 121 in color. Two volumes. Index. Price $30. St. Louis, C. V. Mosby Co., 1952.

A great many oral surgeons are already familiar with Thoma's *Oral Surgery*, the first edition of which was published in 1948. Although the improvements of the new edition are not major, it would appear pertinent to list briefly the principal enlargements and additions which have been made:

1. A chapter on oral plastic procedures (not including cleft lip and cleft palate) is added.
2. Antibiotic therapy is given more space and a separate chapter.
3. A chapter dealing principally with bone

grafts and splints for repair of acquired defects of the mandible is included.

4. Oral surgical-prosthodontic problems are treated more fully and placed in a separate chapter.

5. The material on general and local anesthesia has been increased and placed in a separate chapter.

A considerable improvement in the new edition is simply the improved arrangement of material with better grouping of subject matter for easy access.

Chapter I—The Principles of Surgery—an interesting coverage of basic information. Includes sterilization technic, emergency procedure, suturing and use of electrosurgery.

Chapter II—The General Care of the Patient—a brief review of systemic diseases which should be considered in evaluating the patient and a very limited amount of information on preoperative and postoperative care.

Chapter III—Anesthesiology—the material on general anesthesia is not up to Dr. Thoma's standard. Its principal value lies in noting some of the contraindications to specific anesthetic agents. The material on local anesthesia is better, but it still leaves this the weakest chapter in the book.

Chapter IV—Chemotherapeutics and Antibiotics—a short review of the subject as it pertains to oral surgery.

Chapter V—Dentoalveolar Surgery—a thorough coverage (258 pages) of extraction technics, treatment of abscesses and periodontal surgery.

Chapter VI—The Treatment of Abnormalities of the Edentulous Mouth—shaping of the alveolar process, extension of alveolar sulci, excision of gingival hyperplasia and other surgical-prosthodontic problems.

Chapter VII—The Treatment of Traumatic Diseases of the Jaws—an excellent section (399 pages) which could be a volume in itself. Good illustrations and clear descriptions of the treatment of fractures, lacerations and other traumatic conditions.

Chapter VIII—The Treatment of Odontogenic Diseases of the Maxillary Sinus—a concise review of the anatomy and pathology of the antrum with methods of treating odontogenic problems in that region.

Chapter IX—The Treatment of Osteomyelitis and Necrosis of the Jaws—treatment of tuberculous, actinomycotic and syphilitic lesions of the jaws, as well as post-radiation necrosis, sequestrectomy and similar conditions.

Chapter X—The Treatment of Diseases of the Mandibular Joint—a review of the anatomy of the joint, the disturbances of the joint with their possible etiologies and operative procedures.

Chapter XI—The Treatment of Infections of the Face and Neck—discussion of alveolar abscesses as continued from Chapter V, and a thorough study of other infections of the face and neck.

Chapter XII—The Treatment of Diseases of the Salivary and Mucous Glands—diagnosis, sialography and operative procedures.

Chapter XIII—The Treatment of Diseases of the Fifth and Seventh Nerves—A review of motor and sensory disturbances with their treatment.

Chapter XIV—The Treatment of Cysts of the Jaws—a well illustrated, well organized chapter with operative procedures in detail.

Chapter XV—The Treatment of Benign Tumors of the Mouth and Jaw—good, lucid coverage of a subject which is difficult to handle in an orderly way. Includes classification, biopsy technic, operative procedures and a brief of the pathology of the various tumors.

Chapter XVI—The Treatment of Malignant Tumors—an excellent review (115 pages) of diagnostic, surgical and therapeutic procedures.

Chapter XVII—The Treatment of Developmental Deformities of the Jaw—includes operative procedure for correcting prognathia, retrognathia, open bite, facial asymmetry. There is very little information here relative to the preoperative preparation, consideration of occlusion and other such matters.

Chapter XVIII—The Treatment of Acquired Defects of the Mandible—an excellent consideration of bone grafting, acrylic and tantalum splints in reconstruction of the mandible.

Chapter XIX—The Treatment of Oral Abnormalities and Defects—oral plastic procedures, correction of lip defects and closure of oroantral fistulae, with very good illustrations. Does not cover cleft lips and palates.

To this reviewer's mind this is the best oral surgery text yet written. It is lucid and comprehensive, yet not smothered by detail. Its improvements over the 1948 edition are worth while. It is a text that will be very useful to all students of oral surgery.—*James O'Brien.*

■ Medical Biographies, the Ailments of Thirty-three Famous Persons. By Philip Marshall Dale. First edition. 259 pages with 32 illustrations. Price $4. Norman, Okla., The University of Oklahoma Press, 1952.

The reader does not have to be listed among the morbidly curious to be captured by this book. In preparing these 33 short medical biographies the author dug deep and well into the best of reference material and aided by his medical education, used excellent judgment in selecting those items, incidents and activities in the life of each subject that contributed to the biographee's death. In weaving these contributing factors into a finished fabric Dr. Dale necessarily supplies his readers with much informative data which perhaps is more valuable because of its historical significance than because of its moribund nature.

How such noted persons as Christopher Columbus, George Washington, Lord Byron and Robert Louis Stevenson struggled against a lifetime of ill health, how the weakness of human flesh handicapped others, how the lack of modern medical skill contributed to the untimely death of many famous personages and how all of these factors influenced the course of history makes interesting and valuable reading; so interesting, in fact, that many readers will be stimulated to delve further into the excellent references listed chronologically on the last 15 pages of the book.

■ Transactions of the Conference on Morale—and the Prevention and Control of Panic. Conference held under joint auspices of New York Academy of Medicine and the Josiah Macy, Jr. Foundation. 75 pages. New York City, 1952.

This conference was directed toward the understanding of the problems of individual and mass anxiety, fear and panic. It was specifically concerned with the situation which might arise if war, especially atomic warfare, came to this continent and affected the American people directly. The participants in this conference were well-qualified psychiatrists and others, many of whom had personal experience in European wars where they had observed the morale of people under attack.

Building the morale of people to withstand catastrophe is stressed as the greatest preventive against panic and even as a deterrent to war. Panic arises from frightening experiences which are outside the bounds of ordinary experiences or way of life. Some people can adapt themselves to such experiences better than others.

In any mass atomic attacks on a principal city, perhaps not more than three per cent of the population will actually be injured. It is the other 97 per cent that must care for the casualties and clean up the rubble. They must maintain a high level of morale and face the situation with courageous hearts—all for one and one for all.

The chief cause of panic is anxiety over the unknown. Most people can face realities if they are known. Therefore, in any catastrophe the greatest morale builder is publicity and dissemination of authentic information.

There is too little public participation in the Civil Defense program. There is too much apathy which in time of stress will lead to confusion. Adequate civil defense, under strong leadership, will teach people that they can protect themselves from disaster and will build the strongest public morale.—*R. W. Bunting.*

■ THE OPERATIVE REMOVAL OF TUMORS OF THE PAROTID SALIVARY GLAND. Hayes Martin. Surgery 31:670, May, 1952.

Two cardinal principles in the removal of parotid gland tumors are first, the complete removal of the growth and second, avoidance of injury to the seventh nerve. For the majority of parotid tumors, either benign or malignant, the ideal program would be one designed to remove the tumor together with a portion of the parotid gland and to spare all or whatever branches of the nerve are uninvolved by the growth. If a growth appears to infiltrate the gland diffusely, it is obvious that the entire organ must be removed; in these cases, it is not only justifiable but mandatory that the main seventh nerve and its entire plexus be sacrificed.

It has been found that an immediate and direct approach to the main nerve just after it emerges from the stylomastoid foramen to enter the parotid gland is the soundest and most workable procedure. The upper border of the posterior belly of the digastric muscle and its attachment to the mastoid process serve as important landmarks in its exposure. Once the main trunk of the seventh nerve has been demonstrated, the gland and any tumor within it may be dissected off readily under direct vision without any danger of inadvertent injury to the nerve or its major branches. The mandibular branch tends to be rather isolated, and for this reason it is advisable to dissect it out carefully.

Arterial ligation is not absolutely necessary, and in routine resection of the parotid gland it is best omitted since there is always a possibility that neck dissection for parotid cancer may have to be done later in certain cases. —*C. Dean Couch, Jr.*

■ INFECTIVE GANGRENE OF THE MOUTH (CANCRUM ORIS). D. B. Jelliffe. Pediatrics 9:544, May, 1952.

In a group of 53 cases of infective gangrene of the mouth in Western Nigeria two stages were evident: Stage 1, showing only gingivitis and infective necrosis of the bone and Stage 2, showing gingivitis and bone necrosis together with varying degrees of gangrene of the soft tissue of the oral cavity. The ages varied from two to five years.

The usual sequence of events was as follows: After a prolonged period of general malnutrition (six months to two years) and in particular of protein and vitamin B privation, the child developed a Vincent's gingivitis. In many instances the infection stopped at this point, but in the malnourished the infective process spread along the roots of the teeth to involve the underlying maxilla or mandible with subsequent bone necrosis (Stage 1). At this stage again in some instances the infection halted, but in more severe cases it spread from the area of bony inflammation by direct contact to the adjacent soft tissues. Gangrene of the inner surface of the cheek resulted, which advanced peripherally and through the thickness of the soft tissue (Stage 2). This was a rapid process, the full extent of the necrotic area being apparent at once. Intramuscular procaine penicillin (150,000 units) was administered once daily until all necrotic material, whether soft tissue or bone, had sloughed to leave a clean surrounding area. A high protein, well-balanced diet was given in all cases. Once the necrotic debris was removed, the natural reparative power of the child's tissues was capable of producing a remarkable degree of spontaneous healing without any attempt at surgical

assistance being made in most instances. The mortality rate for the whole series was about 30 per cent.—*C. Dean Couch, Jr.*

■ Plasma Transfusions in Hemophilia. S. Van Creveld and M. M. P. Paulssen. Blood 7:710, July, 1952.

The usual method of treating hemorrhage in hemophilic patients is still the administration of whole blood. Good results have often been obtained by repeated transfusions of fresh or frozen citrated plasma and also of lyophile-dried plasma, either concentrated or unconcentrated. With citrated blood or plasma the coagulation time of hemophilic patients can be shortened for at least 24 hours, the effect disappearing more or less rapidly according to the amount of blood or plasma injected. In this study transfusions of heparinized plasma had a greater and more lasting effect on the coagulation time of hemophiliacs than transfusions of citrated plasma. Both *in vitro* and *in vivo*, heparinized plasma caused a far greater consumption of prothrombin as determined with the two-stage method than did citrated plasma. In using the one-stage method, however, no important differences in prothrombin activity were found after transfusions of heparinized and of citrated plasma respectively. In a hemophiliac with a circulating anticoagulant, transfusions of heparinized plasma were unable to shorten the coagulation time to any important degree; neither did these transfusions cause an important decrease of serum prothrombin as determined by the two-stage method.—*C. Dean Couch, Jr.*

■ Bone Transplanting to the Mandible. Varaztad H. Kazanjian. Am. J. Surg. 83:633, May, 1952.

Four conditions are usually necessary for successful bone transplantation: (1) bone grafts should be transplanted into healthy tissue; (2) the recipient site should have a good blood supply; if avascular scars are present, they should be excised and healthy vascularized tissue should be provided; (3) bone grafts should be in close contact with the existing normal bone; (4) immobilization of the grafts and recipient bones should be positive. The types of graft most frequently used in the face are the block osteoperiosteal graft and the chip graft.

It should be an invariable rule to make provision for the maintenance of the remaining separated parts of the mandible in as near their normal position as possible by the use of retaining devices. If the mandibular segments are already distorted by the uncontrolled pull of muscles or by scars, the first step toward reconstruction is to correct the malposition of the mandibular segments and to maintain that position with the proper means of fixation. Reconstruction is facilitated if the temporomandibular joint and the condyle are preserved.

The surgeon's work is not complete unless provision is made to prepare the oral cavity for the proper retention of a denture. This may involve further operative procedures within the oral cavity. As a means of contour restoration, bone graft is superior to any other substance, provided that the transplant can be inserted in close proximity to living bone. There is no valid reason for the use of dead cartilage or inert substances when living tissue in a sufficient quantity for restoration purposes can be obtained from the patient.—*Herbert J. Bloom.*

■ A New Surgical Procedure in Bilateral Reconstruction of Condyles, Utilizing Iliac Bone Grafts and Creation of New Joints by Means of Non-Electrolytic Metal. A Preliminary Report. Arthur E. Smith and Marsh Robinson. Plast. & Reconstruct. Surg. 9:393, May, 1952.

In the treatment of condylar disturbances it is necessary to consider the indications for condylectomy and the anatomy and physiology of the temporomandibular joint. Scar tissue which forms in the area of a bilateral condylectomy undergoes contraction and results in a progressive retrusive open bite deformity. In one case

of such a deformity, the temporomandibular fossa and the upper end of the ramus were exposed; and the ramus fragment was prepared to receive the lower end of a bone graft. All the tissue was removed from the glenoid fossa. A bone graft was taken from the crest of the ilium and shaped into a condyle to fill the prepared defect. This was placed into position, and the teeth were wired into occlusion. The same procedure was repeated on the opposite side three months later. Nonelectrolytic metal was used to construct metal onlays, 3/32 of an inch thick and in the arc of a circle the center of which passed through the center of the reconstructed heads of the condyloid processes. A small tab was turned down so that the onlay could be attached with a screw to the ramus.

One year after the last operation the right graft was surgically exposed, and a slot was cut at the point of union of the new grafted ankylosed condyle and the ramus. The onlay was placed into the slot and fixed to the ramus by a self-tapping, nonelectrolytic screw. Approximately two months later the procedure was repeated on the opposite side. Intermaxillary wires were left in place for three months after the last procedure. After the removal of the intermaxillary wires, the patient had normal intermaxillary relation, centric occlusion, a hinge-type masticatory function and a normal profile appearance.—*C. Dean Couch, Jr.*

■ RADIOCURABILITY OF CANCER. Maurice Lenz. Am. J. Roentgenol. 67:428, March 1952.

A cancer is regarded as radiocurable if past experience with similar cancers shows freedom from clinical evidence for at least a five year period after treatment with roentgen rays, radium or radioactive substances. By the use of the term "radiocurable," it is possible to compare statistics on types of cancer.

If a cancer has had a natural clinical course of an inherently slow growth, its radiocurability is high. An example of a cancer of inherently slow growth is a well differentiated cancer with well developed connective tissue stroma. A less well differentiated cancer in the same group of neoplasms but with little stroma progresses more rapidly, spreads more readily and becomes wider in extent. Clinical evidence confirms this statement. One study of lymphosarcoma showed a 12 per cent survival rate in cancer of the reticulum type, a 23 per cent rate in cancer of lymphocytic cell type and a 41 per cent rate of five year survival in cancer of giant follicle type.

Age and sex are important factors in radiocurability. In sarcomas and blood dyscrasias, the aged as compared with children have a slower growth and a generally higher survival rate. In cancer of the larynx, Hodgkin's disease and lymphosarcoma, the radiocurability rate is higher in the female than in the male.

Radiocurability of cancer is affected by the location, extent and accessibility of the cancer. Epitheliomas on skin and oral or nasal mucosa are likely to be discovered earlier than similar lesions in the bronchi or the midesophagus. If because of the location early symptoms are produced, radiocurability is increased. Thus, cancers of the surface of the vocal cords which cause hoarseness and are therefore detected early have a higher rate of radiocurability than cancers on the laryngeal band with no early symptoms.

Since cancer spreads principally along fascial planes, lymphatics, veins and serous surfaces, the extent and direction of growth are determined by these paths and by barriers such as fascia, dura and bone. Therefore, in radiotherapy of Ewing's endothelioma, which is clinically limited to one end of bone, there may be a subclinical spread along the haversian systems and hence an irradiation of the entire bone. Paucity of lymphatics, as on the free surface of vocal cords, retards metastasis. Abundance of lymphatics as in the pyriform sinus facilitates metastasis.

Radiocurability is affected by the inherent radiosensitivity of cancer. The inherent radiosensitivity determines the dose required for destruction of the lesion. The dosage is usually increased as the practitioner gains clinical experience in radiotherapy of different types of cancer. In one hospital, improvement in radiocurability was noted with increase in doses used in the treatment of lymphosarcoma and

cancer of the urinary bladder, larynx and breast.

Tolerance of cancerocidal radiation is affected by several factors. If a patient suffers from a debilitating disease, he may not be able to withstand a high dose unless the volume of irradiated normal tissue is small. Cancerocidal effect of radiation varies both with the span of treatment and with the amount of radiation; a balance must be struck between the regrowth of cancer in the intervals between treatments and the lessening effect of radiation on the growth.

Clinical awareness of radiation injury to quickly dividing (that is, quickly repairing and growing) epithelium is earlier than detection of similar damage to connective tissue, bone and cartilage. Radionecrosis of bone may not be clinically evident for weeks or even for years after irradiation. Osteomyelitis and radionecrosis may follow extraction of teeth if supporting bones have been exposed to cancerocidal irradiation. Therefore, extraction of teeth and oral prophylaxis should precede by ten days to two weeks the administration of cancerocidal irradiation to jaws so as to allow healing before bone is subjected to severe irradiation injury. Normal bone is likely to be completely devitalized by tissue doses of 5,000 r in four weeks. At times, nevertheless, bone thus irradiated may withstand ordinary strains and stresses of life without breaking down.

Tissue tolerance is affected by poor vascularization. If the blood supply of the tissue is impaired because the tissue has been scarred by disease, operation or repeated intensive therapy, the tissue is unable to withstand cancerocidal irradiation. Excision, therefore, is better than radiotherapy for treatment of cancer arising in such locations. Repeated exposure of malignant neoplasms to weak radiation doses increases fibrosis of the tumor and makes it less radioresponsive. For example, an inguinal lymphosarcoma which had been treated twice weekly with small doses failed to respond when treated with a dose of 3,000 r in three weeks.

Repeated infections of cancer may increase fibrosis and result in lessened radiation response. Cancerocidal doses are not bactericidal and may increase the severity of infection by necrosis of the inflamed tissues. Therefore, infection should be cleared away before cancerocidal irradiation is initiated.

In cross-firing technic and in rotation therapy the normal tissues traversed in reaching the tumor are exposed only to a fraction of the radiation they would receive if the dose were administered through one field.

Tolerance of cancerocidal irradiation varies with inherent radiosensitivity of normal irradiated tissue. Tolerance decreases with increasing radiation administered to the tumor and with the shortening of the time used to administer the dose. Attempts to reduce to a minimum the volume of normal tissue exposed to cancerocidal doses has led to restriction of radiation fields to clinically involved areas. This restriction puts emphasis on the need for accurate localization of the cancer and on the importance of the selection by the hospital physicist of the best mode of irradiation.

Every hospital should have a physicist trained in radiation physics, who would be an instructor in radiation physics, who would check electrical equipment for radiation output, help calculate dosages and select the best physical approach for the administration of cancerocidal doses.

The likelihood of accurate clinical localization of the cancer increases with the expertness of the radiotherapist and with the time he is able to devote to the individual cancer patient. Three classes of specialists administer radiotherapy in the United States:

1. There is a relatively small number of radiotherapists who devote their entire time to their specialty.

2. A number of surgeons occasionally administer radiotherapy. Their chief training and interest are in surgery. The frequency of their failure with radiotherapy causes them to lose confidence in this type of treatment. A few gynecologists and other regional surgeons have had adequate training for the administration of regional radiotherapy.

3. The majority of physicians who administer radiotherapy are radiologists whose primary interest is in diagnosis.

The system in England where radiotherapy is entirely divorced from roentgen diagnosis is preferable. The quality of radiotherapy in Eng-

land and in the Scandinavian countries improved distinctly when roentgen diagnosis and radiotherapy were separated. There is a tendency for radium to be used much less in this country than in England, simply because fewer radiotherapists have had experience and training in treatment by roentgen rays and radium.

To increase the radiocurability of cancer in the United States and to raise the level of American radiotherapy to a place equivalent to that of American roentgen diagnosis it is suggested that: (1) the training period in radiotherapy required of candidates for certification by the American Board of Radiology should be lengthened and (2) radiotherapy should be recognized as a separate and distinct specialty. —*Charles C. Alling.*

■ MODERN CONCEPTS OF SHOCK AND ITS TREATMENT. James V. Warren. G. P. (Amer. Acad. Gen. Prac.) 6:51, July, 1952.

The term shock portrays a clinical picture, as does the word dyspnea; therefore the term should not be used to indicate the nature of the process and the mechanisms producing the syndrome. In most instances of shock there is evidence of a decline in arterial blood pressure. This fall in pressure may be due to cardiac output or to peripheral resistance. In secondary shock, the low pressure is usually due to the former cause and in primary shock to the latter.

Modern physiological interpretation is that the cardiac output is the result of the summation of body needs rather than the deciding factor. The normal range of cardiac activity is wide, and only when there is circulatory inadequacy does the cardiac output become the limiting feature. In shock the circulatory inadequacy is severe and therefore may last only a relatively short period of time before death ensues unless the process is reversed. The circulatory difficulty in shock is most frequently not due to failure of the pumping mechanism itself (heart disease) but is due to other factors, such as loss of blood volume, which result in failure of the pumping mechanism. Various humoral factors have recently been identified and implicated in the development of the shock syndrome. The most important of these are the vasoexcitor and vasodepressor materials which are produced by the ischemic kidney and ischemic liver and muscle respectively.

Circulatory impairment caused by shock may result in specific localized deficiencies of flow and may cause focal organ dysfunction. Particularly is this true in the kidney and liver. This loss of function of a single organ may be enough to tip the balance and cause death despite the correction of other elements in the shock picture.

Irreversible shock represents a situation where the cells of one or more organs have become permanently damaged by the period of circulatory impairment or by some associated factor. The liver may play an important role in the development of an irreversible state. This has been demonstrated in dogs by giving aureomycin, which depresses the bacterial growth of the gastrointestinal tract, a probable source of products deleterious to the liver.

A major factor in primary shock is the loss of arteriolar tone with subsequent fall in blood pressure. It is now believed that there is no evidence of generalized increase in capillary permeability but that this occurs only locally.

In most cases of shock the primary aim of therapy is replacement of the lost blood. If whole blood is not available, plasma is at present the most widely used substitute. Pooled plasma is a dangerous source of the virus of infectious hepatitis producing jaundice in two to four per cent of the recipients. If no other fluids are available, saline solutions are helpful as an emergency measure. It must be remembered that replacement therapy with intravenous fluids is indicated in all forms of shock where there is evidence of plasma volume loss, but all forms of shock do not require blood transfusions. Other additional therapeutic measures which may be of help are pressor drug therapy, ACTH and cortisone and antibiotic therapy, especially if there is tissue damage.—*C. Dean Couch, Jr.*

■ CHRONIC PAROTITIS. P. Hennion and R. Bataille. Rev. de stomatol. 52:436, July 1951.

A complete review of the literature on the subject of chronic parotitis reveals that there are various theories concerning the chronic enlargement of the gland.

Certain authorities maintain that with some patients in a poor general condition there is a decrease in the salivary flow, that, furthermore, if oral hygiene is poor, an ascending infection may develop in the duct and from the secretions and pus, a plug will form in that duct.

The reflex theory is explained thus: It has been observed that acute or chronic dilatation of the bowels or ureters may be related to stimulation of the sympathetic system; some authors, for instance, Dechaume, think that the same sort of process may occur in Stensen's duct. A sympathetic nerve which could bring about the relaxation of a duct could likewise effect the constriction of a sphincter. The reverse is also true as is evident from a study of the tenth nerve.

Chronic parotitis may be caused by a process similar to that causing cholecystitis.

If the sphincter of the duct of the parotid gland did not relax for a certain time, there would be an enlargement of the gland with the formation of a mucous plug in the duct.

There are other interesting theories as to the cause of parotitis. It has been proved by cytodiagnosis that in some cases there is no salivary secretion; some authors believe that the lack of secretion itself is a cause of secondary infection. Another theory is that spasms may develop during the elimination of a small stone and may be responsible for retention and crisis.

R. Debre and Lawe Lyon think that in chronic parotitis of children, there is dystrophy of the muscular and conjunctival tissue of the small excretory ducts in the gland.

Infectious parotitis may occur in patients with tuberculosis, syphilis or actinomycosis.

Toxic parotitis may be due to the presence in the system of mercury, lead, copper or iodine or to uremia. As parotitis of these types progresses without signs of inflammation or pus, it may be considered a mere functional hypertrophy. The secretion of the gland itself helps to eliminate toxic bodies.

Another type of parotitis is characterized by "simple hypertrophied parotid"; in this type there is mere enlargement of the gland without inflammation. The etiology is unknown, though there seems to be some connection with endocrine disturbances such as in diabetes.

Mikulicz's disease, Besnier-Boeck disease and Schaumann's disease are other types of parotitis.

In Mikulicz's disease, there is hypertrophy of the salivary and of the lacrimal glands with progressive sclerosis of the gland.

In Besnier-Boeck disease and in Schaumann's disease, parotitis is one of the symptoms of disease of the reticuloendothelial system, characterized also by cutaneous and bony lesions, enlargement of lymph nodes and infiltration of the lungs. Often the disease is associated with an iridochoroiditis (Heerfordt's syndrome). A biopsy is necessary to confirm this diagnosis.

Parotitis with Gougerot-Sjögren's syndrome is characterized by a progressive xerostomia with enlargement of the parotid gland, by xerophthalmia with complete dryness of the conjunctiva and polyarthritis; the dryness of the mouth and the progressive enlargement of the parotid gland correspond to the progressive sclerosis of the gland.

Chronic parotitis in some cases seems to be related to mumps. The course of the disease is a slow process with relapses. The real cause may not be mumps but rather some virus disease.

In all cases of chronic parotitis, it is important to make use of biopsy, cytodiagnosis and sialography to help establish the diagnosis. —*J. P. Levignac.*

Announcements

■ Tufts College Dental School Announces Courses in Minor Oral Surgery, General Anesthesia

Postgraduate courses in minor oral surgery and general anesthesia will be presented during June by Daniel J. Holland and staff at Tufts College Dental School. The dates for the courses are: minor oral surgery, June 1-5 and general anesthesia, June 8-12. Tuition for either course is $125. Further information may be obtained by writing to the director of postgraduate studies, Tufts College Dental School, 136 Harrison Avenue, Boston.

■ New Dean of New York University College of Dentistry Named

The new dean of New York University College of Dentistry is Raymond J. Nagle of Boston, president of the New England Association of Dental Examiners, practicing specialist in prosthodontics and associate editor of the *Journal of Prosthetic Dentistry*.

Dr. Nagle, 52, was graduated from Harvard University Dental School in 1924 and did graduate study in the field of dental alloys at Massachusetts Institute of Technology. He was appointed to the faculty of Harvard Dental School in 1924 and continued as a member until 1948, except for a period (1933-36) during which he worked with a research group of the American Dental Association and the National Bureau of Standards in an investigation of dental materials and technics.

Dr. Nagle succeeds the late Walter W. Wright. Claus F. Hinck, Jr., chemist and dental researcher, has been acting dean of the school during the past year.

■ Fédération Dentaire Internationale, Through International Dental Journal, Reports on World Dentistry

International Dental Journal, quarterly publication of the Fédération Dentaire Internationale, is being offered to dentists in the United States for a yearly subscription fee of $8.50. Edited by Professor H. H. Stones of the University of Liverpool, the publication contains reports from all over the world on dental research projects, trends, new developments and activities.

Subscriptions may be placed with British Publications, Inc., 30 East 60th Street, New York 22.

■ University of Minnesota Announces Graduate Program

Graduate study programs of 2-3 years, leading to the degree of master of science are now being arranged by the University of Minnesota. A program may be arranged with a major in oral surgery, oral pathology, orthodontics, oral medicine, periodontics or restorative dentistry (operative, prosthetics, pedodontics or endodontics) and a minor in one of the fundamental health sciences.

An alternate program in the basic sciences, with special reference to dentistry, leads to the doctor of philosophy degree.

A limited number of fellowships and teaching assistantships are available to the graduate students. Stipends for these appointments range up to $3,600 per year. Further information and application forms may be obtained from the dean of the Graduate School, University of Minnesota, Minneapolis.

■ Colorado Dental Foundation to Present Seminar in Histopathology of the Oral Cavity

The histopathology of the oral cavity will be the topic of the seventh annual seminar of the Colorado Dental Foundation, to be held June 21-25 at the Fine Arts Center in Colorado Springs, Colo.

Lecture and microscopy sessions will be presented by Harry Sicher of Chicago, Joseph L. Bernier of Washington, D. C., Balint Orban of Colorado Springs and Joseph P. Weinmann of Chicago.

Further information may be obtained and registration may be made by writing to the Colorado Dental Foundation, 629 North Nevada Avenue, Colorado Springs, Colo.

■ American Academy of Dental Medicine to Discuss Nutrition

Nutrition will be the topic of the seventh annual meeting of the American Academy of Dental Medicine, to be held June 26-28 at the Shoreham Hotel in Washington, D. C. A program of sightseeing and entertainment has also been arranged. The meeting will be open to all interested dentists and physicians, as well as to members of the Academy, it has been announced by Harold R. Gelhaar, president.

Full details and reservations may be obtained from William M. Greenhut, secretary, 124 East 84th Street, New York 28.

■ Two-Year Course in Basic Sciences to Be Offered by University of Illinois College of Dentistry

The department of oral and maxillofacial surgery at the University of Illinois is now accepting applications for a two-year course in the basic sciences which will begin September, 1953. The course, offered on a full-time postgraduate and graduate basis, will carry credit toward a Master of Science degree.

Information and application forms may be obtained from the department of oral and maxillofacial surgery, College of Dentistry, University of Illinois, 808 South Wood Street, Chicago 12.

■ Berkshire Conference in Periodontology and Oral Pathology to Meet June 14-18

The postgraduate division of Tufts College Dental School will conduct an advanced conference in periodontology and oral pathology under the direction of Irving Glickman and staff, June 14-18 at Lenox, Mass. The conference will consist of four days of lectures, seminars and panel discussions on clinical problems, to be presented by outstanding teachers.

In addition to Dr. Glickman, the faculty of the conference will include Col. Joseph Bernier, Louis A. Cohn, Donald Kerr, Paul Losch, Harry Sicher, David Weisberger, Roger Guillemin, Lent C. Johnson and I. Snapper.

The curriculum will include nine courses, arranged so that the mornings and evenings are devoted to professional activities, leaving afternoons free for recreation at the resort site of the conference. Further information may be obtained by writing Berkshire Conference, Tufts College Dental School, 136 Harrison Avenue, Boston 11.

Editorial communications

■ ORIGINAL COMMUNICATIONS—This journal invites concise original contributions in the broad field of clinical and experimental surgery of the mouth and associated structures, including roentgenology, diagnosis, anesthesia and oral surgical pathology. Articles are accepted for publication with the understanding that they are contributed solely to the JOURNAL OF ORAL SURGERY. All manuscripts are subject to editorial modification. Neither the editors nor the publishers accept responsibility for the views and statements of authors expressed in their communications.

■ MANUSCRIPTS—Manuscripts submitted for publication should be sent to Fred A. Henny, Editor, Henry Ford Hospital, Detroit, Michigan.

Manuscripts should be typewritten on one side of the paper only with double spacing and liberal margins. The author's name and the abbreviated title of the article should appear at the top of each manuscript page. The original should be sent to the editor and a carbon copy retained by the author. Manuscripts will not be returned if accepted for publication.

References should be placed at the end of the article and should conform to the style of the Quarterly Cumulative Index Medicus; viz., name of author, title of article and name of periodical with volume, pages, month and year. They should be numbered and should appear in the same order as that of the superior figures inserted in the appropriate positions in the text.

■ ILLUSTRATIONS—Illustrations accompanying manuscripts should be unmounted and numbered. The author's name should appear on the margin or back.

Authors should insert figure numbers at appropriate places in the text. The original drawings, or glossy print photographs of them, should accompany the manuscript. Legends for illustrations are to be typewritten in a separate list with numbers corresponding to those on the photographs and drawings.

A reasonable number of halftone illustrations will be reproduced free of cost to the author, but special arrangements must be made with the editors for color plates, elaborate tables or extra illustrations. Copy for zinc cuts (such as pen drawings and charts) should be drawn and lettered in India ink or with black typewriter ribbon (carbon paper placed with carbon against back of sheet for bolder type). Ordinary blue or colors will not reproduce. Only good photographic prints or drawings should be supplied for halftone work.

■ CASE REPORTS—Case reports will constitute an important department of the journal and the editors welcome case reports that are of unusual clinical value or that present exceptional conditions of interest to dental surgeons.

■ EXCHANGES—Letters, exchanges, reprints and all other communications relating to the JOURNAL OF ORAL SURGERY should be sent to the American Dental Association, 222 East Superior Street, Chicago 11.

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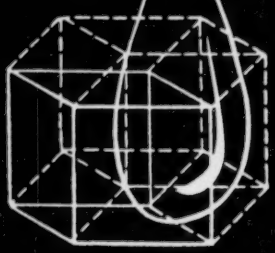

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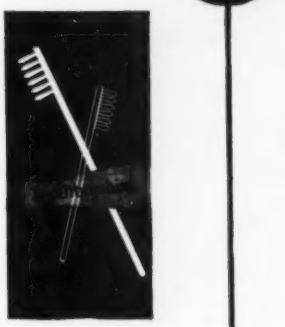

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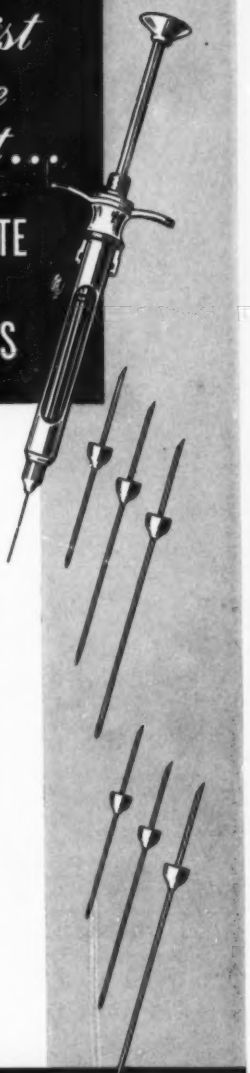

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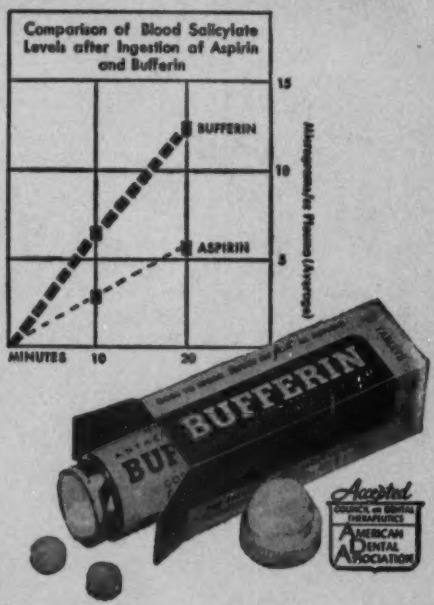

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